LEAFLETS

OF

PHILIPPINE BOTANY

Edited by **A. D. E. ELMER, A. M.**

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ERRATA

P. 1566, l. 17 from bottom for *Podochilus lucbanense* read *Podochilus lucbanensis*

P. 1578, l. 12 from top for *Eria palawanense* read *Eria palawanensis*

P. 1593, ll. 5 and 6 from bottom for (1788) p......; et Amoen. Acad., (1754) p......,—read (1767) p. 656; et Amoen. Acad. IV (1754) p. 131 correct the same on page 1595.

P. 1596, l. 10 from top for number 13508 read 14307.

P. 1604, l. 13 from bottom for "interior" read "inferiores"
l. 15 from bottom for "quorum" read "quarum"

P. 1606, l. 2 from top for "mm." read "cm."

P. 1611, l. 19 from bottom for "insula" read "insulae"

P. 1612, l. 6 from bottom for "saturalibus" read "suturalibus"

P. 1614, l. 6 from bottom for "lata" read "alta"

P. 1615, l. 18 from top for "parsim" read "sparsim"

P. 1636, change 5 to 6 in the page number.

P. 1654, l. 13 from bottom for *Linociera vidallii* read *Linociera vidalii*

P. 1669, l. 1 from bottom for "Retated" read "Related"

P. 1674, l. 16 from bottom for "trial" read "trail"

P. 1697, l. 16 from bottom for *Hypoestes addisoniense* read *Hypoestes addisonense*

P. 1787, l. 16 from bottom for *Cyrtandra elatostemmoides* read *Cyrtandra elatostemoides*

P. 1782, l. 12 from bottom for *Elatostemma* read *Elatostema:* correet the same in line 15 from top of page 1846.

P. 1814, l. 13 from top for *Parastrophis* read *Paratrophis*

P. 1830, l. 17 from bottom for *Sagittipetalum palawanense* read *Sagittipetalum palawanensis*

P. 1880, l. 2 from top for *Ophiorrhiza caespitosa fulva* read *Ophiorrhiza caespitulosa fulva*

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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ORCHIDACEAE NOVAE ET CRITICAE INSULARUM PHILIPPINARUM*

By

Oakes Ames

(North Easton, Mass.)

In the following paper orchids collected by *Mr. Elmer* in Mindanao, Negros, Luzon, Palawan and Sibuyan are treated. The greater part of the species described as new were found in Mindanao and Negros.

The genera are arranged according to the system adopted in *Engler* and *Prantl's* "Die natürlichen Pflanzenfamilien." Under each genus the species are placed in alphabetical sequence.

Four genera, *Diglyphosa*, *Dilochia*, *Lepidogyne* and *Tainia* are here recorded for the first time as natives of the Philippine Islands. *Liparis latifolia Lindl.* is new to the list of Philippine species. Forty two new species are described. A complete set of the specimens from which my descriptions were drawn is preserved in my herbarium.

From *Mr. Elmer's* very full field notes I have quoted liberally, incorporating in my descriptions information as to color of flowers and leaves, and as to other peculiarities which are usually lost to view in herbarium specimens.

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*Proof corrected by *Emma O. Elmer*.

HABENARIA R. Br.

Habenaria Elmeri sp. nov.

Herba terrestris, 3—5 dm. alta, foliosa. Radices? Caulis gracilis, erectus. Folia elliptico-lanceolata inferne, superne lanceolata, acuminata, acuta, ad basim vaginata, 4—15 cm. longa, 1.5—5 cm. lata, chartacea in sicco, circiter 3, remota. Racemi laxi, 12—15 cm. longi. Flores ± 15. Bracteae inflorescentiae lanceolatae, acutae, 1—1.8 mm. longae, 3—7 mm. latae. Sepala lateralia oblongi-lanceolata, 3-nervia, 7 mm. longa, 2.5 mm. lata, retroflexa, obtusa vel subacuta, labello breviora. Sepalum superius late ovatum, 3-nervium, ad apicem rotundatum, 5.5 mm. longum, 4.5 mm. latum prope basim, leviter cucullatum. Petala erecta, simplicia, anguste lanceolata, obtusa vel subacuta, coriacea, circiter 6 mm. longa, ad basim circiter 1 mm. lata. Labellum simplex, crassum, deflexum, ligulatum, circiter 1 cm. longum, circiter 1.5 mm. latum. Calcar ovario brevius, 1 cm. longum, ad apicem valde inflatum, circiter 2 mm. in diametro, superne valde attenuatum. Processus stigmatis 0.

From the specimens at hand *H. Elmeri* appears to bear from 3—4 leaves, the uppermost one being bract-like or much reduced. The lowermost leaf in one specimen measures 10×3 cm., in another 11×4.5 cm. The measurements given in the above description apply to the range of variation in the length and width of the leaves on the same plant. The gynostemium in the specimens examined appeared to possess no stigmatic processes. *H. Elmeri* may be assigned to § *Platanthera*.

Mindanao: District of Davao, Todaya (Mt. Apo), September, 1909, *A. D. E. Elmer*, 11845^a. What appears to be the same species is represented by specimens from Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), May, 1908, *Elmer*, 10002.

Habenaria luzonensis sp. nov.

Herba terrestris 6.5 dm. alti, folia prope basim caulium conferta, oblongi-lanceolata, acuminata acuta, 2—3 dm. longa, circiter 3 cm. lata, membranacea. Bases foliorum vaginantes. Bracteae inflorescentiae lanceolatae valde acuminatae, acutae, glabrae, usque ad 1.5 cm. longae ovariis breviores. Flores in racemo laxo dispositi. Racemi circiter 2 dm. longi, glabri. Sepala lateralia elliptica, circiter 6 mm. longa, deflexa. Sepalum dorsale valde concavum, erectum, cucullatum, circiter 5 mm. longum. Petala simplicia, sepalo dorsali breviora, linearia, 1-nervia, obtusa, 5 mm. longa, 1 mm. lata. Labellum 3-lobatum, laciniae laterales oblongae, ad apicem rotundatae, 3-nerviae, media latior. Lobus medius linearis, subulatus, rigidus, acutus, circiter 6 mm. longus. Lobi laterales circiter 6 mm. longi, 2—3 mm. lati. Processus stigmatis abbreviati. Calcar ovario brevius, 1.5 cm. longum, inflatum.

Habenaria Luzonensis is well characterized by the peculiar lip which resembles a triangle, the apex of which has been drawn out into a subulate point. The lateral lobes are somewhat reflexed.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7636.

ADENOSTYLIS Blume.

Adenostylis benguetensis sp. nov.

Aff. *A. affini* (*Benth.*); flores flavidi, capsulae glabrae. Caules erecti usque ad 2.5 dm. alti, graciles, longi villosi supra folia; pili albidi. Folia magis minusve ad medium caulium conferta. Bases foliorum vaginantes, scariosae, amplae, in petioles breves graciles contractae. Lamina lanceolata, acuminata, acuta, magis minusve asymmetrica, 3—4.8 cm. longa, usque ad 1.5 cm. lata, patentia, membranacea. Bracteae inflorescentiae anguste lanceolatae longe acuminatae, acutae, circiter 5 mm. longae, sparsim pubescentes. Flores in racemo laxo dispositi. Pedicelli ut videtur nulli. Sepala lateralia oblongi-lanceolata, obtusa, 1-nervia, circiter 3 mm. longa, circiter 1.5 mm. lata. Sepalum dorsale concavum, 3.5 mm. longum, glabrum, petalis adhaerens. Petala cuneato-oblonga. Labellum 3 mm. longum, ad basim valde concavum, super medium constrictum, ad apicem in laminam transverse oblongum dilatatum. Lamina circiter 3 mm. lata, 1 mm. longa. Basis labelli intus processu unciformi. Columna brevis; rostellum erectum, bipartitum.

A. benguetensis and *A. Elmeri Ames* are very nearly related species. From the material at hand the chief distinctions appear to be in the larger leaves and smooth capsules of *A. benguetensis*, and in the apical portion of the labellum which in *A. Elmeri* is divaricately bilobed while in *A. benguetensis* it forms an oblong plate which lies at right angles to the saccate base.

Luzon: Province of Benguet, Baguio, March, 1907, *A. D. E. Elmer*, 8856.

Erect herbs on dead logs near a streamlet at 4000 feet elevation, near Sablan.

Adenostylis Elmeri sp. nov.

Aff. *A. marivelensi* et *A. affini* (*Benth.*) Habitus praecedenti simillimus, diversus in foliis. Herba terrestris, gracilis, 1.5—3 dm. alti. Caules teretes, erecti, pars inferior foliosi. Folia ovato-lanceolata, acuta, membranacea, 1—1.5 cm. longa, fere 1 cm. lata omnia infra medium caulium inserta. Petiolus inflatus ad basim vaginans. Flores in racemo laxo dispositi, albi. Bracteae inflorescentiae, lanceolatae, scariosae, villosae, 1-nerviae usque ad 7 mm. longae. Racemi 3—8 cm. longi, graciles, longe villosi. Pedunculi rubentes, longe villosi, paucivaginati. Capsulae villosae. Sepala lateralia circiter 3.5 mm. longa, oblongi-lanceolata, acuminata, acuta, sparsim pubescentia. Sepalum dorsale lanceolatum, concavum circiter 4 mm. longum, sparsim pubescens, petalis adhaerens. Petala obtusa, cuneato-oblonga, 3.5 mm. longa. Labellum 4 mm. longum ad basim saccatum vel valde concavum super medium constrictum, ad apicem in tabulas cuneatas duas, divergentes, dilatatum; basis labelli intus processu unciformi. Columna brevis; rostellum erectum, bipartitum; pollinia pyriformia caudiculae gracili affixa, glandula oblonga.

Luzon: Province of Benguet, Baguio, March, 1907, *A. D. E. Elmer*, 8648.

Found on moss covered decayed logs in springy places at 5000 feet above sea level. Stems succulent, from fleshy pubescent roots.

LEPIDOGYNE Blume.

Lepidogyne longifolia Bl. Orch. Jav. 94, t. 25. *Neottia longifolia Bl.* Bijdr. 406.

Strict succulent herb in moist woods at 4000 feet altitude. Roots flexible, less than 1.5 cm. thick, covered with a brown matrix of short hairs. Leaves ascending, strict, succulent, dark green especially on the upper surface; midnerve prominent beneath. Stems strict above, 2.5 cm. thick, terete, green. Inflorescence a spicate many flowered raceme, above 6 dm. long. Bracts greenish brown, 2—4 cm. long, linear lanceolate, acuminate, acute, ascending. Pedicels of the same color, erect, sepals similarly colored, otherwise the perianth is red and white. Labellum saccate, the tip slender, recurved, on the inner surface of the sac several short appendages arise. The genus *Lepidogyne* has heretofore been unknown from the Philippines.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9579.

TROPIDIA Lindl.

Tropidia mindanaensis sp. nov.

Herba terrestris. Caules erecti, elati, foliosi, ramosi. Folia oblongi-lanceolata, acuminata, acuta, chartacea, in siccitate conspicue 5-nervia, ad basim vaginantia, usque ad 15 cm. longa, 1.5—3.3 cm. lata. Inflorescentiae laterales, pedunculi 2—3 cm. longi, bracteati, bracteis vaginantibus usque ad 1.5 cm. longis. Flores capitati, vel in racemis densis congesti. Racemi usque ad 1 cm. longi, bracteati, pluriflori, bracteis lineari-lanceolatis, acutis, 5 mm. longis. Sepala lateralia basi sub labello in mentum breve connata, usque ad 12 mm. longa, oblonga, acuta. Sepalum dorsale oblongum, acutum, concaviusculum, arcuatum, fere 1 cm. longum. Petala oblongi-falcata, acuta, sepalo postico subsimilia. Labellum 8 mm. longum, cymbiforme, lanceolatum, ad basim columnae sessile, canaliculatum, basi in saccum breve obtusum productum, apice acuto, valde deflexo et recurvato, nerviis prominentibus.

Mindanao: District of Davao, Todaya (Mt. Apo), September, 1909, *A. D. E. Elmer*, 11785.

In rich humus covered well drained soil of a wooded ridge at 2750 feet above sea level, between the junction of the Perak creek and the Sibulan river. Stems usually in pairs, terete; the dark green leaves ascending, slightly recurved, similarly dull green on both sides, thinly chartaceous, much reduced toward the base; peduncles, bracts and pedicels green, the pedicels recurved; flowers soft in texture, persistent, pale or a yellowish green.

DILOCHIA Lindl.

Dilochia Elmeri sp. nov.

Planta rigida, 15—24 dm. alta, caespitosa, epiphytica. Folia plana, alterna, elliptico-lanceolata, valde acuminata, sessilia, cum vagina articulata. Flores in racemum terminalem densum, divisum, dispositi. Bracteae inflorescentiae, pedicello longiores, deciduae, rigidae, infra racemum imbricatae, triangulari-lanceolatae, conduplicatae, acutae vel subacutae. Sepala lateralia oblonga, subfalcata acuta. Sepalum superius simile, margine involuto. Petala oblongi-falcata, acuta. Labellum ad basim columnae erectum, sepalis brevius, 3-lobatum; lobi laterales parvi, obtusi, divaricati; lobus medius lobis lateralibus multo major, flabelliformis, disco carinis 5 crenatis. Columna crassa, arcuata.

Plants forming rigid tufts, epiphytic. Stems several, about 1 cm. thick, terete, descending, the tips suberect, basal half leafless, covered with brown imbricating scales. Leaves about 3 dm. long, ± 6 cm. wide, prominently 9-nerved when dry, about 4 cm. apart. Peduncle terminal, hidden below the raceme by several imbricating rigid bracts 3 cm. long, branching, the main branch about 2 dm. long. Flowers in a rather dense raceme, about 4 cm. long including the pedicel and ovary, odorless, succulent, subpendulous, sepals and petals 2.5 cm. long, 5 mm. wide, yellowish green, somewhat tinged with brownish purple. Bracts subtending the flowers about 2 cm. long, carinate, rigid, deciduous. Labellum 2.5 cm. long, purplish, spotted on the upper surface, strongly decurved at the apex. Lateral lobes about 3 mm. long, terminal or middle lobe 1 cm. long by 1 cm. wide. On the disc of the labellum 5 longitudinal carinae are situated, the 2 outer ones shorter than the 3 middle ones. Column purplish.

The genus *Dilochia* has heretofore been unknown from the Philippines. *Dilochia Elmeri* resembles *Dilochia Cantleyi* (*Hook. f.*) *Ridl.*, although it is larger in all its parts. It also is similar to *Dilochia Wallichii Bl.* from which it differs mainly in the number of the carinae on the disc of the labellum.

Mindanao: District of Davao, Todaya (Mt. Apo), May, 1909, *A. D. E. Elmer*, 10664.

DIGLYPHOSA Blume.

Diglyphosa Elmeri sp. nov.

Herba terrestris, glabra, caudice repente, foliis in petiolis elongatis inferne carnose incrassatis solitariis, nervosis, plicatis, elliptico-lanceolatis, acuminatis, membranaceis, scapo caudicali, inferne vaginato, superne dense racemoso. Bracteae lanceolatae, acuminatae, deflexae, membranaceae, violaceae. Sepala lateralia falcata, acuta, 5-nervia. Sepalum superius lineari-lanceolatum, elongatum, acutum. Petala falcato-lanceolata, acuta, sepalis lateralibus latiora 5-nervia. Labellum lingulatum, obtusum. Columna arcuata. Pollinia 2.

Loose terrestrial, succulent herbs in rich moist humus covered soil of dense forests. Rhizome creeping. Leaves approximate, borne singly on the creeping rhizome, long petiolate. Lamina elliptic-lanceolate acuminate, prominently 5-nerved, about 15 cm. long, 5.6—6.6 cm. wide. Petiole purple, subterete below the middle, deeply grooved on the upper side above the middle, including the thicker slender base 15 cm. long. Scape shorter than the leaves, about 15 cm. long, sheathed at intervals by several loose, tubular bracts about 2 cm. long. Raceme densely flowered, 6 cm. long. Bracts of the raceme about 7 mm. long, about 1 mm. wide. Lateral sepals falcate, lanceolate, acute, deflexed, about 7 mm. long, about 3 mm. wide near the base. Upper sepal longer than the lateral sepals, linear-lanceolate, 12 mm. long, about 2 mm. wide. Petals subfalcate, lanceolate, 8—9 mm. long, 3 mm. wide. Labellum about 6 mm. long, strongly curved, margin of the basal portion erect, margin of the deflexed apical portion decurved. Calli 0. Column 4 mm. long, 6 mm. long including the foot. Pollen masses 2, anther bifid.

The genus *Diglyphosa* has heretofore been unknown from the Philippines.

Mindanao: District of Davao, Todaya (Mt. Apo), September, 1909, *A. D. E. Elmer*, 11815.

Ovaries purplish, twistingly striate; perianth segments falcately recurved, of a peculiar yellowish brown color; blades ascendingly recurved, thinly coriaceous, much paler beneath, deep green above with very dark green blotches.

COELOGYNE Lindl.

Coelogyne Elmeri sp. nov.

Herba epiphytica. Rhizoma repens. Pseudobulbi remoti, subcylindracei vel subfusiformes circiter 7 cm. longi, rugosi in sicco, diphylli. Folia elliptico-lanceolata, acuta, petiolata, 9—13 cm. longa, 2.8—4 cm. lata, nervosa, subcoriacea. Petiolus sulcatus circiter 2 cm. longus. Pedunculus erectus, circiter 1 dm. longus. Flores succedanei eodem tempore singuli aperti, subvirides. Pedicelli 1 cm. longi. Bracteae inflorescentiae deciduae? Sepala lateralia lanceolata, acuminata, acuta, 11 mm. longa, 3.5 mm. lata. Sepalum dorsale cucullatum, 12 mm. longum. Petala anguste linearia 11 mm. longa, prope basim 1 mm. lata, prope apicem 0.5 mm. lata. Labellum 11 mm. longum, panduratum, bilamellatum, carina media brevissima in basi labelli addita. Columna arcuata, 5 mm. longa.

Coelogyne Elmeri from the material at hand, clarified by field notes of *Mr. Elmer*, appears to be a near ally of *C. tumida J. J. Sm.* from which it is clearly distinguishable by the foregoing description. The general habit and the details of the flower indicate § *Longifoliae.* The elongated, somewhat fusiform pseudobulbs 4—10 cm. distant on the stout rhizome and the successional opening of the flowers suffice to differentiate *C. Elmeri* from all other species of the genus heretofore ascribed to the Philippine Islands. The labellum is 3-lobed, pandurate, the basal lobes rounded, constituting a suborbicular base from which the roundish middle lobe is separated by a short isthmus. At the base the lip is broader than at the tip.

Mindanao: District of Davao, Todaya (Mt. Apo), May, 1909, *A. D. E. Elmer*, 10694.

Clumps upon trees of damp forests at 3750 feet above sea level, north of the Baruring river. Stems rigid, crookedly branched, attached to the moss covered tree trunks; root stem smooth, green except for the brown sheaths.

PHOLIDOTA Lindl.

§ **Pseudopholidota** sect. nov.

Pseudobulbi caespitosi, monophylli. Scapus lateralis a basi pseudobulbi ortus, multiflorus. Columna gracilis, elongata, stelidiis, oblongis, stigma juxta ortis.

Pholidota Elmeri sp. nov.

Herbae in habitu caespitosae. Radices multae, crassae, ramosae. Pseudobulbi plus minus compressi, cylindracei, obscure rugosi, paulatim fastigati, ad apicem monophylli 3—4.5 cm. longi. Folium oblongi-lanceolatum, acuminatum, acutum, petiolatum, usque ad 2.5 dm. longum, usque ad 4.5 cm. latum, in sicco chartaceum, venosum. Scapus gracilis usque ad 3 dm. longus, multiflorus, lateralis. Bracteae inflorescentiae rigidae, circiter 2 mm. longae, ovato-lanceolatae, acutae. Pedicellus cum ovario circiter 5 mm. longus, gracilis. Sepala lateralia ovata, acuta, 6 mm. longa, 4 mm. lata, 5-nervia. Sepalum dorsale oblongum vel oblongi-lanceolatum, subacutum, cucullatum, circiter 7 mm. longum. Petala linearia 1-nervia acuta vel subacuta, subfalcata, 7 mm. longa, circiter 1.5 mm. lata. Labellum complicatum, ad basim saccatum. Epichilium 3-lobatum, lobus medius 4 mm. longus, cuneatus, ad apicem 3-dentatus, dentes abbreviati, rotundati; lobi laterales erecti, falcati, obtusi, 3 mm. longi, circiter 1 mm. lati. Ad basim lobi utriusque lateralis callus vel papilla. Lobus medius in disco pubescens. Hypochilium 4 mm. longum, tubulatum, crassum, superne sulcatum, bicornutum ad apicem. Columna gracilis 6 mm. longa, cruciformis, stelidia 2 mm. longa.

Island of Palawan: Province of Palawan, Puerto Princesa (Mt. Pulgar), April, 1911, *A. D. E. Elmer*, 12971.

On sides of small tree trunks near the river at 250 feet altitude and 3 yards above the moist gravelly soil. Roots short, terete, dry, spongy; pseudobulbs dull green, ascending, obscurely rigid and

more or less compressed; leaves solitary, one to each pseudobulb, ascending, recurved, pale green on both sides, deeply folded toward the base, tips recurved, otherwise nearly flat; scapes arising from the base of the pseudobulb, rachi and pedicels yellowish green; capsules triangular, three quarters of an inch long, yellowish green. The color of the flowers is described by *Mr. Elmer* as follows: "Buds whitish and purplish, the floral parts in anthesis turning yellow."

DENDROCHILUM Blume.

Dendrochilum Elmeri sp. nov.

Planta caespitosa. Pseudobulbi pyriformi, rugosi. Folia oblongi lanceolata ad basim attenuata, ad apicem acuminata, acuta, multinervia coriacea. Pedunculus gracilis folio longior. Bracteae inflorescentiae glumaceae, lanceolatae, acutae. Flores flavidi. Sepala et petala valde retroflexa. Sepala lateralia oblongi-lanceolata, acuta, 3-nervia. Sepalum superius simile. Petala sepalo supremo majora, ovato-lanceolata, 3-nervia, subacuta. Labellum crassum, late ovatum, obtusum, ecallosum. Columna rigida, crassa; alae laterales, vel stelidia, terminalia, falciformia, obtusa; ala apicalis quadrata.

Pseudobulbs about 2.5 cm. long, comparatively soft, dull green or brown. Leaves including the long petioles 15—26 cm. long, up to 3.3 cm. wide, conspicuous. Scape naked below the inflorescence, up to 3 dm. long, longer than the leaves or equalling them. Raceme comparatively loose, about 7 cm. long. Bracts ± 5 mm. long, slightly longer than the ovary, straw-colored, margin brownish. Flowers odorless, yellow. Lateral sepals 7 mm. long, about 2 mm. wide, fleshy. Upper sepal similar to the laterals. Petals larger than the sepals, 7 mm. long, 3.5 mm. wide. Labellum 7 mm. long, about 6.5 mm. wide. Column 2 mm. long.

D. Elmeri is a near relative of *D. turpe* (*Ames*) *Pfitz.*, but is larger in all its parts. The reflexed sepals and petals form an important distinguishing characteristic between this species and its allies.

Mindanao: District of Davao, Todaya (Mt. Apo), May, 1909, *A. D. E. Elmer*, 10635.

Found on moss covered limbs at 7500 feet altitude on Mt. Celelan.

Dendrochilum lucbanense sp. nov.

Pseudobulbi conferti, elongati, rugosi, fusiformes circiter 5 mm. longi, in sicco 3 mm. in crassitudine, monophylli. Folium usque ad 9 cm. longum, circiter 9 mm. latum, anguste lanceolatum subacutum, subchartaceum, in petiolum angustatum, costa media prominente. Petiolus brevis, usque ad 1 cm. longus. Pedunculus usque ad 1 dm. longus, folio longior. Racemus gracilis, sublaxiflorus, circiter 7 cm. longus. Pedunculi infra inflorescentiam bracteis 2—4 imbricantibus vestiti. Bracteae glumaceae, obtusi, illae flores subtendentes 3 mm. longae. Sepala lateralia 2.5 mm. longa circiter 2 mm. lata prope basim, ovata, acuta, 3-nervia. Sepalum dorsale 2.5 mm. longum, circiter 1 mm. latum, oblongi-ellipticum, 3-nervium. Petala 2.5 mm. longa, 1.5 mm. lata, cuneato-obovata, 3-nervia. Labellum circiter 1 mm. longum, 3-lobatum, parvum. Lobi laterales erecti, falcati, obtusi. Lobus medius tridentatus, denticulis rotundatis. Calli 3 in disco, in sinu loborum lateralium et in basi intermedii in sacculum. Gynostemium minutissimum, rostellum protensum.

In habit similar to *D. Curranii Ames*, but in the flowers similar to *D. pumilum Reichb. f. D. lucbanense* approaches very closely the group composed of *D. affine*, *D. simulacrum* and *D. pumilum*, but is distinguishable by its elongated, small flowered raceme.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7571.

Densely tufted clumps on moss covered trees overhanging streams at 1600 feet altitude. Leaves rather thin, pseudobulbs rigid; flowers greenish yellow, the bracts turning brown with age. Common!

Dendrochilum palawanense Ames Orchidaceae II; 103, fig.

Mr. Elmer's specimens from the island of Palawan agree in all essentials with the type specimens of *D. palawanense*. They are somewhat smaller than the specimens of the type number of *D. palawanense* in my herbarium, the smallest plant measuring slightly less than 15 cm. high from the base of the pseudobulbs to the tip of the raceme. The leaves, including the petiole, range between 7 and 11 cm. in length and are linear-lanceolate, attenu-

ated at both ends and furnished with a conspicuous median nerve. The bidentate, abbreviated arms of the column are characteristic. *Mr. Elmer's* specimens were found on Mt. Pulgar, the type locality for *D. palawanense*.

Island of Palawan: Province of Palawan, Puerto Princesa (Mt. Pulgar), May, 1911, *A. D. E. Elmer*, 13195.

MALAXIS Sw.

Malaxis mindanaensis sp. nov.

Herba terrestris. Caulis simplex, erectus, strictus, purpureus. Planta 2 dm. alta, foliosa. Folia disticha, usque ad 6 cm. longa, 3.3 cm. lata, ovata, submembranacea, color non in specimene sicco apparens. Petiolus ad basim dilatatus, vaginans, purpureus. Pedunculus elongatus gracilis circiter 1 dm. longus, bracteis linearibus ± 5 mm. longis. Racemus gracilis, circiter 5 cm. longus. Bracteae inflorescentiae lineares, dependentes, purpureae, color non in specimene sicco apparens. Sepala lateralia 3 mm. longa, 1.5 mm. lata, oblongi-elliptica, convexa, obtusa. Sepalum dorsale simile. Petala linearia, 2.5 mm. longa. Labellum sagittatum, auriculis longe triangulis obtusis 1.5 mm. longis. Lobus medius elongatus, anguste oblongus, bifidus, circiter 1.5 mm. longus, lobi laterales bidentati. Gynostemium 1 mm. longum, auriculis obtusis divergentibus.

This species is well characterized by the distichous leaves, about 9 in number, described by *Mr. Elmer* as flat, horizontal, coarsely corrugated, submembranaceous, dull green above, light purple beneath. The flowers are described as purplish and yellow with green pedicel and purple bracts. The labellum suggests that of *M. dentata Ames* (Orchidaceae II:126, fig.) from which it differs in the longer auricles, bidentate lateral lobes and the deeply bifid, slender middle lobe. The general form of the labellum is sagittate.

Mindanao: District of Davao, Todaya (Mt. Apo), September, 1909, *A. D. E. Elmer*, 11855.

Terrestrial herb in very rich humus covered soil of dense forested flats at 4000 feet above sea level. Stem at the base creeping, soft or fleshy, purplish brown, the leafy portion erect, also deep purple and more or less flattened; the deep purple petioles are ascending.

Malaxis negrosiana sp. nov.

Herba terrestris. Habitat in madidis sylvis. Caulis ± 6 cm. altus, bracteis subarcte appressis vaginantibus tectus. Folia late ovato-lanceolata, acuminata, acuta, nervosa, submembranacea, basi attenuata, usque ad 15 cm. longa, 5.5 cm. lata, paulatim in petiolum latum vaginantem transiens. Pedunculus cum racemo ± 25 cm. longus, gracilis. Bracteae retroflexae, lineari-lanceolatae, acutae, infimae 1 cm. longae. Racemi subdensi, multiflori, erecti. Sepala lateralia suborbicularia 2.5 mm. longa, 2 mm. lata. Sepalum dorsale oblongi-lanceolatum 3—3.5 mm. longum. Petala linearia 3 mm. longa, 1-nervia. Labellum subtrilobum, ad apicem bifidum, auriculis erectis elongatis subacutis. Auriculae triangulari-lanceolatae 3 mm. longae, 1 mm. latae, 1-nerviae. Lobus medius rotundatus 2 mm. latus. Columna 1 mm. longa.

The elongated auricles which are longer than the anterior portion of the labellum are quite characteristic of this species. The inflorescence is described as purplish by the collector.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9600.

Terrestrial, in fertile half swampy soil in dense woods at 4000 feet above sea level. Leafy stem subjoined at the base by an erect subterete green and hard pseudobulb 6 inches long; leaves subverticellate, ascending, conduplicate on the upper side toward the petiole, much lighter green beneath, submembranaceous; inflorescence dark purple.

LIPARIS L. C. Rich.

Liparis Elmeri sp. nov.

Similitudinem gerit cum *L. liliifolia*. Caulis elongatus, bracteis chartaceis imbricatis, arcte vaginantibus dense vestitus. Folia lanceolata, acuminata, valde acuta, chartacea. Petiolus latus vaginans. Pedunculus gracilis ebracteatus erectus, folia excedens. Bracteae inflorescentiae minutae. Racemus laxiflorus. Flores circiter 12, similis *Liparidi liliifoliae*. Sepala subaequalia, linearia, attenuata. Petala valde linearia, antennaeformia. Labellum orbicularis, breviter unguiculatum, ad

apicem breviter apiculatum, ad basim lamellae 2 complanatae, dentiformes, erecti, margine irregulariter dentato. Columna gracilis valde arcuata, proper apicem valde dilatata.

Plants ± 2 dm. tall, green, succulent. Stem ± 7 cm. long. Leaves several, flaccid, ± 7 cm. long, ± 2.5 cm. wide. Peduncle elongated, about 2 dm. tall, slender, bearing on the upper third about twelve large flowers which recall in aspect the raceme of *Liparis liliifolia*. Bracts of the inflorescence about 3 mm. long. Pedicel and ovary about 1.5 cm. long. Lateral sepals 9 mm. long. Upper sepal about equal to the laterals. Petals 9 mm. long, less than 0.5 mm. wide. Labellum 9 mm. long, about 7 mm. wide. Column about 5 mm. long.

Liparis Elmeri is a near ally of *Liparis Rheedii Lindl.*

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9445. Here also I refer specimens from Luzon: Province of Tayabas, Lucban, May, 1907, *Elmer*, 7579.

In every loose fertile soil of moist woods at 4000 feet altitude. Stems soft, green, succulent; leaves somewhat flaccid; buds and calyx segments dull purple, corolla greenish yellow.

Liparis latifolia Lindl. Gen. and Sp. Orch. pl. 30.

I refer to this species specimens from Mindanao. The plants agree with material in my herbarium collected by *R. Schlechter* in Sumatra. *Liparis robusta Hook f.* is a closely allied species.

Mindanao: District of Davao, Todaya (Mt. Apo), May, 1909, *A. D. E. Elmer*, 10648.

Small descending clumps on trees and shrubs in forests at 6750 feet on Mt. Calelan. Roots whitish, limp; stems flexible, whitish, flattened, covered with similarly colored bracts; leaves coriaceous and quite limp, similarly green on both sides, conduplicate toward the base; flowering stalk terete, subpendulous, curved, brownish white; flowers limp, deciduous, brown, odorless, the pedicels whitish.

Liparis negrosiana sp. nov.

Herba terrestris. Caules elongati, circiter 1.5 dm. longi, crassi, bracteis vaginantibus vestiti. Folia circiter 5, elliptico-

ovata, acuminata, acuta, membranacea, prope apicem caulium conferta, ± 1.5 dm. longa, ± 7 cm. lata, margine sinuato. Pedunculus foliis longior; racemi ± 1 dm. longi, subdensi. Bracteae inflorescentiae lineari-lanceolatae vel lineari-triangulares, usque ad 1 cm. longae, acutae. Caules, bracteae et flores atropurpurei. Sepala lateralia 4 mm. longa, elliptica, obtusa. Sepalum dorsale circiter 5 mm. longum, anguste oblongum, obtusum. Petala spathulato-falcata, obtusa, 1-nervia, 5 mm. longa. Labellum flabellatum, retusum, 3 mm. longum, ad apicem 4 mm. latum, crassum, ad basim in unguem brevem contractum, callis parvis. Columna arcuata, apice cucullato.

A distinct species resembling very closely *Liparis bituberculata Hook.* The spathulate-falcate petals are characteristic.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9606.

Loose clumps upon earth and old decayed timbers on stream banks of a very moist gulch at 4000 feet above sea level. Leaves spreading, nearly flat with crinkled margins, submembranaceous, light green above, paler beneath, the bracts and petioles of the same color; the stems, bracts of the inflorescence and the flowers wholly of a dark deep purple or a more nearly indigo blue; stems of inflorescence lax and wavy; capsules one half inch long, narrowly oblanceoloid.

CESTICHIS Pfitzer.

Cestichis linearifolia sp. nov.

Rhizoma repens, pseudobulbi remoti ad basim tumidi subito attenuati plus minus 3 cm. longi, vaginati, monophylli. Vaginae complanateae, acutae. Folia linearia, subacuta, apiculata, coriacea, 2.5 dm. longa, 1 cm. lata. Pedunculi circiter 24 cm. longi, bialati, complanati, recurvati. Racemi usque ad 5 cm. longi. Bracteae inflorescentiae cymbiformes, circiter 1 cm. longae, acutae, distichae, approximatae. Pedicellus gracilis, cum ovario 5 mm. longus, sepala lateralia lanceolata, acuta, 6 mm. longa, 1.5 mm. lata. Sepalum dorsale concavum, 6 mm. longum. Petala linearia, circiter 5 mm. longa circiter 0.5 mm. lata. Labellum 5.75 mm. longum, oblongum, prope basim, 4 mm. latum, obscure panduratum, ad apicem rotundatum, leviter retuso-apiculatum; ad basim calli 3 quorum 2 laterales complanati, erecti, obtusi; callus medius subcucullatus erectus. Columna crassa, 3 mm. longa.

Cestichis linearifolia is a near relative of *C. Merrillii Ames* from which species it differs in the linear leaves and in the complanate, lateral calli at the base of the labellum.

Mindanao: District of Davao, Todaya (Mt. Apo), August, 1909, *A. D. E. Elmer*, 11494.

Found in dense clumps, 6000 feet above sea level, growing on the upper side of moss covered limbs in dense forests. Flowers dull brown; pseudobulbs light green: stems ascending or subpendulous, sheathed, flattish; leaves usually solitary, gracefully recurved, similarly deep green on both sides, smooth, coriaceous; peduncle green, much flattened, ascendingly recurved; floral bracts greenish, closely imbricating, also much flattened.

OBERONIA Lindl.

Oberonia Elmeri sp. nov.

Convenit cum *O. cylindrica Lindl.* habitu. Differt petalis integris. Herba terrestris, usque ad 1.8 dm. alta. Folia ensiformia, acuminata, acuta, 7—12 mm. lata a latere visa. Pedunculus elongatus, folia excedens. Flores flavidi, verticellati. Racemi circiter 1 dm. longi. Sepala lateralia elliptica, circiter 1 mm. longa. Sepalum dorsale simile. Petala integra, oblonga vel spathulata, obtusa, circiter 1 mm. longa. Labellum 2 mm. longum, quadrilobum vel trilobum lobo intermedio bifido, lobis lateralibus acutis. Columna minuta. Capsulae glabrae.

Oberonia Elmeri is a near ally of *O. cylindrica Lindl.* from which it differs in the entire margin of the petals and in the nearly entire margin of the lobes of the labellum. The divisions of the labellum suggest those of *O. cylindrica.*

Luzon: Province of Benguet, Baguio, March, 1907, *A. D. E. Elmer*, 8434.

Small loose tufts upon trees of damp ravines in limestone gulches at 4750 feet altitude. Subpendulous foliage very flexible, yellowish green; inflorescence of the same color; capsules yellow.

PODOCHILUS Blume.

Podochilus Elmeri sp. nov.

Herba epiphytica. Caules rigidi, complanati, 12 dm. alti. Folia disticha, oblongi-elliptica, coriacea, breviter apiculata, 2.5—4.5 cm. longa, 9—19 mm. lata. Internodii 1—1.5 cm. longi. Pedunculi valde elongati, usque ad 21 cm. longi, graciles, bracteis acutis vaginantibus vestiti. Racemi laterales, abbreviati, pauciflori. Bracteae inflorescentiae circiter 2 mm. longae, anguste lanceolatae, acutae. Flores minuti, caduci. Sepala lateralia ad pedem gynostemii decurrentia, mentum obtusum formantia, triangularia, acuta, 3 mm. longa; mentum 4 mm. longum. Sepalum dorsale concavum, elliptico-oblongum, subacutum, 2.5 mm. longum. Petala subspathulata, obtusa, late unguiculata vel late oblanceolata ad basim vix attenuata, circiter 2.5 mm. longa, 1.75 mm. lata ad apicem, circiter 1 mm. lata prope basim. Labellum 3-lobatum, 4 mm. longum, circiter 3 mm. latum, basim versus membrana vel lamella semilunari ad lobum medium decurrens. Lobi laterales prope medium labelli, minuti, obtusi. Lobus medius valde retusus, 2 mm. longus, 2 mm. latus. Columna brevis, pede producta.

This interesting species forms large clumps on trees in the dense forests along the Baruring River where it was found at an altitude of 3500 feet. The hard, tough, flattened stems are persistent. The inflorescence, mostly toward the end of the stems, is borne on elongated peduncles which arise from the axils of the leaves. Outer organs of the perianth greenish red and white, the inner ones red. The callus arises at the base of the lip and is V-shaped, the arms extending close to the margin and converging near the base of the middle lobe.

Mindanao: District of Davao, Todaya (Mt. Apo), May, 1909, *A. D. E. Elmer*, 10718.

Podochilus longilabris sp. nov.

Herba epiphytica caespitosa, gracilis, similitudinem gerit cum *P. microphyllo Schltr.* Caules subpenduli vel suberecti, usque ad 2.7 cm. longi, circiter 1 mm. in crassitudine. Folia disticha, oblongi-lanceolata, 7—11 mm. longa, circiter 2 mm. lata, coriacea, nervo intermedio in apiculum producto, apiculum 0.75—1 mm. longum. Inflorescentia terminalis (et lateralis?) abbreviata, circiter 1 cm. longa, pauciflora (flores 2—3?). Bracteae inflorescentiae valde lanceolatae, acuminatae, concavae, in apiculum productae. Flores 7—8 mm. longi. Sepala lateralia linearia nervosa, extus carinata, acuta, mentum fere 2 mm. longum formantia, 7 mm. longa, circiter 1.25 mm. lata. Sepalum dorsale lineare. Petala oblonga, membranacea, subfalcata, obtusa, 7 mm. longa, circiter 2 mm. lata. Labellum 7.5 mm. longum 2 mm. latum, integerrimum, oblongi-ellipticum, obtusum, prope basim attenuatum, ad basim in auriculas, minutas, acutas productum; unguis 0.75 mm. longus, 3-nervius. Columna bipartita.

The labellum resembles the petals but near the base it is abruptly attenuated and produced into two auriculiform, triangular lobes; above the contracted base it is elliptic-oblong with a rounded, blunt apex.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7585.

In small, loose tufts on moss covered tree trunks of the rain forest at 3600 feet above the sea. Flowers suberect, bluish white or sometimes pink.

Podochilus lucbanense sp. nov.

Herba epiphytica. Caules penduli, superne ramosi, ± 6 dm. alti. Folia valde membranacea, 3—4 cm. longa, 4—7 mm. lata, oblongi-lanceolata, inaequaliter bilobata, nervo intermedio in apiculum brevem producto, ad apicem margine inaequaliter dentato. Inflorescentia terminalis, foliis brevior, bracteis, chartaceis. Racemi circiter 2.5 cm. longi, bracteae retroflexae, lanceolatae, circiter 5 mm. longae, 3-nerviae. Flores flavidi. Sepala lateralia ovato-lanceolata, mentum obtusum formantia, 6 mm. longa. Sepalum dorsale ovato-ellipticum, circiter 4 mm. longum, obtusum. Petala 4 mm. longa, vix 2 mm. lata, oblonga, leviter curvata, valde obtusa. Labellum oblongum, 6.5 mm. longum, circiter 3 mm. longum, valde obtusum vel truncatum, basim versus membrana vel lamella hippocrepiforme vel V-forme ultra medium decurrens. Columna crassa.

In general aspect similar to *Podochilus xytriophorus Schltr.* from which it differs in its shorter racemes, longer and differently

shaped labellum and in its narrower leaves and more slender habit. The callus on the lip appears to be very much thickened at the base. Unfortunately the material which constitutes the type is not well supplied with perfect flowers.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 8068.

Hanging on moss covered trees at 5750 feet above sea level. Leaves very thin, nearly equally dark green on both sides; inflorescence pendulous, bracts green, flowers yellowish. Rare!

Podochilus luzonensis sp. nov.

Herba epiphytica aff. *P. Elmero*. Caules elongati, 3—10 dm. longi, foliosi. Folia disticha, submembranacea, ± 6 cm. longa, circiter 1.5 cm. lata, oblongi-lanceolata, nervo intermedio in apiculum producto. Inflorescentia terminalis et subterminalis. Racemi usque ad 9 cm. longi. Bracteae inflorescentiae lanceolatae circiter 3 mm. longae. Sepala lateralia circiter 3 mm. longa, triangularia, acuta; ad pedem gynostemii decurrentia, mentum obtusum, formantia. Mentum usque ad 2 mm. longum. Sepalum dorsale valde concavum, lanceolatum, acutum, 3 mm. longum. Petala 3-nervia, oblonga, obtusa, circiter 3 mm. longa, fere 1.5 mm. lata. Labellum oblongum, retusum, fere 4 mm. longum, ad basim sensim angustatum, prope medium leviter constrictum, ad apicem 2 mm. latum, basim versus membrana, vel lamella hippocrepiforme vel V-forme ultra medium decurrens. Columna brevis.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7407.

Found on large shrubs and trees, 2500 feet above sea level in shaded forests. Stems 1 to 3 feet long, numerous, forming large clumps; leaves flexible and very succulent.

Podochilus malindangensis Ames in Philip. Journ. Sci. (Bot.) VI; 49, 1911.

Further studies of this species, specimens of which from the island of Negros are at hand, lead me to believe that the material from which the original description was made must have been undersized. The lateral sepals of the Negros specimens are fully

1 cm. long, those of a flower from the co-type are approximately 8 mm. long. The lip of the Negros plant is 1 cm. long, while the lip of the co-type is 6 mm. long in a flower boiled out for re-study. The lip is pandurate, the apical portion irregularly dentate, near the margin of the basal portion on each side a long slender lamella extends diagonally toward the middle of the disc, vanishing within 1 mm. of the median line; toward the base of the lip these lamellae curve abruptly inwards and join in the basal transverse callus which in this species is highly developed. Undoubtedly there is a much wider range of variation than is accounted for in the original description of *P. malindangense*. *Mr. Elmer* described the inflorescence as follows: "Descending, the floral bracts green, flowers subpendulous, soft, azure blue, especially the terminal portions of the various parts." The collector of the type described the flowers as dark blue. In the original description the characteristic lanceolate-cymbiform floral bracts were described as 8.5 mm. long, in the Negros specimens the longest bract measures 1.4 cm. long. The stems which bear the racemes are defoliated except for a pair of leaves at the summit. It would seem, then, that the tendency to produce the racemes on stems from which the leaves have fallen, is, as suggested in the orginal mention of the species, a characteristic one. In the specimens from Negros one raceme is about 5.5 cm. long.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9543.

Upon moss covered tree trunks at 6000 feet above sea level. Stems 1 to 3 from the same root, descending, green, quite flexible; leaves ascending, quite thin, darker green above, slightly recurved, twisted at the base; inflorescence descending, the floral bracts green, flowers subpendulous and soft.

Podochilus negrosianus sp. nov.

Herba epiphytica. Plantae caespitosae, elatae. Caules teretes, circiter 7.5 dm. longi, foliosi, circiter 5 mm. in crassitudine. Folia disticha, prope medium caulium 8 cm. longa, 2 cm. lata; oblongi-lanceolata, chartacea, ad apicem inaequaliter bilobata, nervo intermedio in apiculum producto, ad basim vaginantia, 7-nervia. Inflorescentiae laterales et terminales, foliis breviores + 4 cm. longae. Pedunculi bracteis imbricatis, arcte vaginantibus

dense vestiti. Flores albidi, caduci; bracteae subtendentes, scariosae, lanceolatae, circiter 5 mm. longae. Pedicellus cum ovario 6 mm. longus. Sepala lateralia 5 mm. longa, mentum obtusum formantia, triangularia vel triangulari-lanceolata, acuminata, acuta, 3-nervia. Mentum circiter 5 mm. longum. Sepalum posticum oblongum, obtusum, 5 mm. longum. Petala 5 mm. longa, vix 1 mm. lata, linearia, subobtusa, 1-nervia. Labellum subcrassum, 7.5 mm. longum infra medium oblongum, supra medium dilatum rotundatum. Callus ad basim bifidus, fere usque ad apicem decurrens.

The labellum is oblong above the base, slightly constricted within 2 mm. of the tip. The tip is suborbicular. The callus is distinctly befid at the base, where the free ends converge on the disc at the middle of the rounded tip of the lip they are thickened. In the type specimen peduncles arise from the axils of the leaves beginning at about the middle of the stem.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9636.

Small tufts upon living trees, near the ground at 3500 feet altitude. Stems terete, hard, green, rigid, descending; leaves flat, ascending, only the tips slightly recurved, thin, paler green beneath; inflorescence from the leaf axils, strict; bracts green; flowers caducous, at right angles to the axis, white.

Podochilus perplexus sp. nov.

Aff. *P. xytriophoro Schltr.* Herba epiphytica, elata, foliosa. Caules elongati, ± 8 dm. longi, subpenduli, teretes. Folia disticha, prope medium caulium 7 cm. longa, 1.6 cm. lata, subcoriacea, ad apicem inaequaliter bilobata, margine integro, nervo intermedio in apiculum producto. Racemi ad summum caulium orti, breviter pedunculati; inflorescentia omnis ad 12 cm. longa. Bracteae inflorescentiae anguste lanceolatae, circiter 3 mm. longae, acutae. Flores numerosi, viridi, purpureo-maculati. Sepala lateralia 3.5 mm. longa, triangulari-lanceolata, acuta, mentum obtusum 1.75 mm. longum formantia. Sepalum dorsale elliptico-lanceolatum, acutum, concaviusculum, 3 mm. longum. Petala elliptico-oblonga, valde obtusa vel ad apicem rotundata circiter 3 mm. longa, vix 1.5 mm. lata, diaphana. Labellum 3 mm. longum, ad apicem 2 mm. latum, subpanduratum in vivo, explanatum in siccitate fere quadratum, vel oblongum ad apicem truncatum. Lamella vel membrana basim versus hippocrepiforme vel V-forme ultra medium decurrens. Columna brevis; rostellum bipartitum.

P. perplexus is undoubtedly a near relative of *P. xytriophorus* from which it is distinguishable by its more rigid habit, more coriaceous leaves, differently formed labellum and more rigid racemes.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7930.

At 2500 feet in damp woods. Tufted herbs upon limbs of large trees; stems green, half drooping at least; leaves very flexible; flowers greenish, spotted with purple, somewhat stiff.

TAINIA Blume.

Tainia Elmeri sp. nov.

Herba terrestris, gracilis. Pseudobulbi pyriformes, circiter 3 cm. alti. Folia terminalis, petiolis gracilibus, ± 3 dm. longa, circiter 2 cm. lata, nervosa in sicco, membranacea, oblongi-lanceolata, acuminata, acuta, margine indistincte crenulata. Scapi aphylli a basi pseudobulborum laterales, erecti, ± 5 dm. longi, vaginati. Flores in racemo laxo. Bracteae inflorescentiae lanceolatae, acuminatae, acutae circiter 1 cm. longae. Racemi circiter 1.5 dm. longi. Pedicellus cum ovario 1.2 cm. longus, glaber. Sepala lateralia in sicco membranacea, 2 cm. longa, circiter 3.5 mm. lata, lineari-lanceolata, acuminata, acuta. Sepalum dorsale simile. Petala sepalis breviora, circiter 1.8 cm. longa, 3 mm. lata, lineari-lanceolata, acuminata, acuta, 5-nervia. Labellum utrinque puberulum, 3-lobatum, 1.5 cm. longum, basi in calcar breve productum. Lobi laterales rotundati, obtusi, 3 mm. longi, circiter 2 mm. lati. Lobus medius lateralibus major, suborbicularis, 4 mm. longus, 4 mm. latus, apiculatus, in disco carinae tres, elevatae, longitudinales, utrinque carinulae adventitiae superadditae. Calcar obtusum 3 mm. longum, circiter 2 mm. in diametro. Columna leviter incurva, longiuscula, antice concava, 2-alata.

In one flower examined the total absence of adventitious carinae, one on either side of the lip, was noted. The three central

keels which extend from the base of the lip into the apical lobe appear to be constant. The genus *Tainia* has heretofore been unknown from the Philippines.

In a list of determinations prepared for *Mr. Elmer* by *Dr. R. Schlechter* of Berlin, No. 8526 is given as *Pholidota imbricata Hook. f.* Undoubtedly a mixture has taken place. This seems very likely in view of the fact that *Elmer's* 8627 which *Dr. Schlechter* identified as *Cymbidium Finlaysonianum* is represented in my material by *Pholidota imbricata Hook. f.*

Luzon: Province of Benguet, Baguio, March, 1907, *A. D. E. Elmer*, 8526.

PLOCOGLOTTIS Blume.

Plocoglottis bicallosum sp. nov.

Herba terrestris. Habitat in madidis sylvis. Caules caespitosi, recurvati, ad basim incrassati, cylindracei, in sicco 2.4 mm. in crassitudine, fibris elongatis ornati, monophylli. Folium longipetiolatum, linearis, coriaceum, distincte 3-nervium, sensim attenuatum, acutissimum, ± 4 dm. longum, circiter 1.5 cm. latum, recurvatum. Scapi aphylli a basi caulium laterales, longi, erecti, circiter 6 dm. longi, pubescentes. Bracteae pubescentes, 8 mm.—1.5 cm. longae, lanceolatae, acutae. Racemi elongati, laxi, rhachidi pubescente. (Pedunculus rhachis et flores dense pubescentes, pilis brevibus, brunneo-fulvis.) Pedicellus cum ovario ± 1.5 cm. longus. Calyx extra adpressa pubescens. Sepala lateralia falcato-lanceolata, acuminata, acuta, 1.6—1.8 cm. longa, circiter 6 mm. lata. Sepalum dorsale lanceolatum, concaviusculum, erectum, circiter 4.5 mm. latum. Petala linearia, acuta, 3-nervia, circiter 1.8 cm. longa, 1.5 mm. lata. Labellum 9—10 mm. longum, 10—11 mm. latum, subpanduratum, denticulatum, longe apiculatum, bicallosum, calli permagni, circiter 3 mm. longi, lamelliformes prope basim labelli dispositi. Columna valde arcuata.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), March, 1908, *A. D. E. Elmer*, 9577.

At 4000 feet above sea level. Stems reddish brown, succulent; buds erect, of the same color; outer floral parts much reflexed in anthesis, brownish red, finely spotted.

Plocoglottis lucbanensis sp. nov.

Herba terrestris. Caules subcaespitosi, purpurei, ad basim incrassati, fibris elongatis ornati, monophylli. Folium oblongi-lanceolatum, acutum, acuminatum ad basim attenuatum, circiter 3.8 dm. longum, usque ad 3.5 cm. latum in petiolum gracilem elongatum contractum distincte 3-nervium. Scapi aphylli a basi caulium laterales, longi, erecti, circiter 6 dm. longi, vaginati, pubescentes. Racemi abbreviati. Bracteae inflorescentiae lanceolatae, acutae, pubescentes, ± 5 mm. longae. Pedicellus cum ovario circiter 1.2 cm. longus, pubescens. Flores atro-flavidi, purpureo-maculati, pubescentes. Sepala lateralia crassa 12 mm. longa, acuta, ad apicem subcucullata, oblongi-lanceolata, extus pubescentia, 5-nervia. Sepalum posticum oblongum, obtusum. Petala 11 mm. longa, linearia, falcata, ad apicem sensim dilatata et incrassata. Labellum crassum 8 mm. longum, circiter 4 mm. latum, ad apicem in apiculo productum. Apiculus valde deflexus, recurvatus. Columna scabrata.

Aside from a slight thickening of the nerves the labellum appears to be ecallose.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7707.

Small tufted terrestrial herbs in damp soil of wooded ravines at 2750 feet altitude. Pseudobulbs and stems conspicuously purple; leaves submembranaceous; buds whitish; flower dull yellow, spotted with purple. Rare!

SPATHOGLOTTIS Blume.

Spathoglottis Elmeri sp. nov.

Aff. *S. chrysanthae,* a quo in laciniis lateralibus labelli et in lobo terminale differt. Folia solitaria, longi-petiolata, lanceolata, elongata, lamina 6.8 dm. longa, circiter 7 cm. lata, prominente nervosa, valde acuminata, acuta, petiolis elongatis, vaginatis, demum in pseudobulbum incrassatis. Scapi e basi pseudobulborum oriundi, aphylli, elongati usque ad 11 dm. longi, racemo sublaxo. Bracteae inflorescentiae rigidae, cymbiformes, obtusae circiter 1 cm. longae, margine pubescente vel ciliolato. Flores flavi 4 cm. in diametro. Pedicelli elongati, cum ovario usque ad 4.5 cm. longi, glabri. Sepala lateralia elliptico-lanceolata, acuta, 2.3 cm. longa, 12 mm. lata. Sepalum dorsale simile. Petala elliptica, obtusa, 2.3 cm. longa, fere 1.4 cm. lata, membranacea. Labellum ad basim bilobatum, lobi laterales oblongi, ad apicem rotundati, 1 cm. longi, 4.5 mm. lati, 3-nervii; lobus medius ultra lobos laterales circiter 12 mm. longus, ad basim hastatus vel bilobatus, ad apicem dilatatus in limbo reniforme, 6 mm. lato productus; lobi basilares triangulares. In disco ultra lobos laterales callus erectus, glaber, bilobus, lobi subcrassi, obtusi, circiter 2 mm. longi. Columna gracilis arcuata.

Spathoglottis Elmeri is a near relative of *S. chrysantha Ames*, but clearly distinguished from that species by its more robust habit, reniform tipped middle lobe of the lip, broad lateral lobes and by its large lanceolate leaves which are said by the collector to attain a length of one meter. To this species I now refer No. 4375 of *M. L. Merrit*, preserved in the Herbarium of the Bureau of Science, which in Philip. Journ. Sci. (Bot.) II; 327, 1907, I identified with *S. aurea Lindl.*

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), May, 1908, *A. D. E. Elmer*, 10080.

Small loose tufts upon moss covered boulders of damp woods at an altitude of 4500 feet. Stem and stem-bases dull purple; flowering stalk terete, purplish toward the base, green toward the apex; pedicels yellowish green; buds and flowers light lemon yellow, odorless.

DENDROBIUM Sw.

Dendrobium Elmeri sp. nov. (§ *Aporum*.)

Aff. *D. atropurpureo* (*Bl.*) *Miq.* Caules simplices, paulum distantes, usque ad 30 cm. alti, omnino dense foliosi. Folia coriacea atroviridia, lineari-lanceolata valde acuta a latere visa, usque ad 6 cm. longa, circiter 6 mm. lata prope basim. Flores rigidi, solitarii fere semper laterales vel pseudoterminales. Racemi breves, usque ad 1.5 cm. longi, bracteolis vaginantibus, vestiti. Sepala lateralia rigida, triangularia, acuta, 4.5 mm. longa, mentum 3 mm. longum formantia. Sepalum dorsale oblongi-lanceolatum, circiter 4 mm. longum, rigidum. Petala 3 mm. longa,

oblonga, valde obtusa, 1-nervia. Labellum obtusum, lineari-oblongum sensim supra medium dilatatum, margine ciliolato, 3-nervium, ad apicem verruculosum.

The flowers are described by the collector as follows: "The outer parts greenish, the inner parts flesh color." The labellum is quite simple, almost linear-oblong, but gradually widened toward the apex from about the middle, the margin of the basal half is minutely ciliolate. The tip of the lip is irregularly thickened, especially so near the margin so that it appears warty. The general aspect of the plant recalls *D. atropurpureum*, which is a smaller species with a very different lip.

Luzon: Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 9249.

Small tufts rather loosely hanging from limbs of trees in woods at 2500 feet above sea level. Stems and leaves not rigid but strongly coriaceous, the leaves equally dark green on both sides; flowers rather rigid, the outer parts greenish, the inner parts flesh color; capsules green, hard, smooth. Rare!

Dendrobium lunatum Lindl. Journ. Linn. Soc. Bot. III; 4.

Specimens of this rare species from the Island of Palawan are here described. Stems 6—25 cm. tall, rigid, caespitose, pendent from the lower side of inclining tree trunks, complanate, greenish. Leaves rigid, up to 3 cm. long, 6 mm. wide, lanceolate, acute, obliquely ascending, complanate, dark green, tips pointing upward in the direction of the stem. Flowers subtended by dull brown bracts, arising at the base of the leaves, lateral. Peduncles as many as eleven. Lateral sepals fleshy, oblong-quadrate, obtuse, about 3 mm. long, forming a blunt mentum 2 mm. long. Upper sepal elliptical, 3 mm. long, obtuse. Petals about 2.5 mm. long, oblong, lanceolate, subacute, 1-nerved, with several oblique lateral nerves. Labellum 3-4 mm. long, unguiculate, cuneate-flabellate or cuneate-oblanceolate, anterior margin slightly crenulate. Callus very fleshy, bilobed at the apex, cuneate, extending nearly to the apex of the lip. Sepals cream colored with purplish bases, petals and labellum white marked at the base with purple.

Island of Palawan: Province of Palawan, Puerto Princesa (Mt. Pulgar), March, 1911, *A. D. E. Elmer*, 12764.

EPIA Lindl.

Eria davaensis sp. nov.

Herba epiphytica, habitu *E. longibracteatae Leav.* Caules foliosi, plus minus 4 dm. alti, internodii circiter 5 mm. longi. Folia linearia, coriacea, longe attenuata, acutissima, 9—15 cm. longa, 8—10 mm. lata, vaginae cylindraceae vel subcomplanatae. Racemi 3—5, ad summum caulium orti, graciles, purpurei, plus minus 2 dm. longi, rhachidi pubescente. Bracteae inflorescentiae, retroflexae lineares, acuminatae, acutae, inferne circiter 1 cm. longae. Pedicellus cum ovario circiter 2 cm. longus. Ovarium lanugine albida dense vestitum. Sepala extus pubescentia; lateralia 5 mm. longa, late ovata, asymmetrica, obtusa, dorsale cucullatum, circiter 5 mm. longum. Petala spathulata, vel oblanceolata, obtusa, 3-nervia, 4.5 mm. longa. Labellum rotundatum, trilobatum, 4.5 mm. longum, 6 mm. latum, vix unguiculatum, lobi laterales 2 mm. longi, lanceolati, asymmetrici, obtusi, subfalcati. Lobus medius perlate reniformis, retusus, apiculatus, 2 mm. longus, 5.5—6 mm. latus. Calli 6, ad basim labelli 3 tubercula quorum medium longius; prope apicem labelli tuberculum permagnum, farinosum, in disco prope sinum, utrinque callus carinatus. Columna minuta.

Eria davaensis appears to be conspecific with specimens referred by *Leavitt* to *E. major Ridl.* I have examined *Leavitt's* material and made a careful study of flowers dissected by him and preserved in glycerine (*Mearns* and *Hutchinson* 4594). The flowers on which he based his conclusions agree in detail with flowers from *E. davaensis.* It is true that the flowers of the species of this section exhibit a wide range of variation, but it is, from my observations, improbable that the Philippine material now under consideration ever approaches *E. major* so closely as to be confounded with it.

Mindanao: District of Davao, Todaya (Mt. Apo), August, 1909, *A. D. E. Elmer*, 11321.

Found in dense clumps upon the limbs of lofty trees in humid forests at 4000 feet above sea level. Stems rigid, hard, green, ascending, slightly flattened; leaves ascending, slightly recurved, lucid green above, duller green beneath, rigid and thick; inflores-

cence erect, composed of from 3 to 5 spikes; spikes purplish and covered with a fine whitish bloom; flowers yellowish, also covered with a whitish bloom, inner organs white and purple spotted.

Eria lamellata sp. nov.

Aff. *E. giganteae*, lamellis lateralibus permagnis. Caules foliosi, elongati, validi. Folia plus minus 26 cm. longa, circiter 2.8 cm. lata, ligulata, coriacea, anguste lanceolata, vel etiam graminea, longe attenuata acutissima, vaginae complanatae. Racemi 6, lanuginosi, circiter 3 dm. longi. Bracteae minutae, retroflexae, lanceolatae, acutae, pedicellus cum ovario lanuginosus. Sepala extus pubescentia, lateralia late ovata, asymmetrica, acuta, 4 mm. longa, 4 mm. lata, dorsale cucullatum, lanceolatum, 3.5 mm. longum. Petala oblonga, acuta, 1-nervia, 3 mm. longa, 1 mm. lata. Labellum obovatum, trilobatum, 5 mm. longum, 4.5 mm. latum, vix unguiculatum; lobi laterales 2 mm. longi, oblongi-lanceolati, asymmetrici, subobtusi; lobus medius unguiculatus, subreniformis 2.5 mm. longus, 2.5 mm. latus, margine crenulato. Calli 6 (-7), 3 ad basim labelli (quorum 2 laterales minuti) unum permagnum, complanatum, prope sinum utrinque, 1 in lobo medio copiose farinosum (1 rarissime ad basim unguis lobi terminalis.) Columna minuta.

Eria lamellata, which is near *E. gigantea Ames*, is readily distinguished by the large lamella-like calli which arise near the sinus of each lateral lobe and extend their free tips to one-half the length of the lateral lobes. On the middle lobe there is one large wart-like tubercle which is copiously covered with a farinose substance. In one flower at the base of the claw of the middle lobe an additional tubercle was detected. This additional tubercle, however, was not noted in three other flowers which were specially examined in search of its occurrence. At the base of the lip the middle one of the three tubercles there situated is elongated and twice as long as its neighbors. *Eria lamellata* belongs to the interesting group of species which *Leavitt* in his paper entitled "The Genus *Eria* in the Philippine Islands" (Philip. Journ. Sci. (Bot.) IV) included in § *Mycaranthes*, and which *Kraenzlin* in his monograph of the genus *Eria* assigned to § *Eriurae*.

Mindanao: District of Davao, Todaya (Mt. Apo), September, 1909, *A. D. E. Elmer*, 11715.

Several stemmed clumps, descending from moss covered large trees in a very humid forested flat along the Mainit creek at 4000 feet above sea level. Stem flattened, covered by the imbricating bases of the leaves; leaves horizontal or descending, twisteds folded toward the base, somewhat paler green beneath, sublucid on the upper side; stems unbranched, 3 feet long, terminated by a several spiked inflorescence; spikes terete, 1 foot long at least, ascending toward the tips, otherwise descending as the stem, yellowish, provided with persistent light yellow reflexed bracts; flowers odorless, soft in texture, dirty yellowish on the outside, yellow on the inside, with purple spots and streaks.

Eria mindanaensis sp. nov.

Herba epiphytica, caespitosa. Caules foliosi, ± 6 dm. alti, internodii circiter 5 cm. longi, vaginae complanatae. Folia oblongi-lanceolata, coriacea, acuminata, acuta, usque ad 1.7 dm. longa, circiter 2.5 cm. lata. Racemi 2, usque ad 2.5 dm. longi ad summum caulium orti, graciles viride, rhachidi pubescente. Bracteae inflorescentiae retroflexae, lineares, acuminatae, valde acutae, viridae, ± 6 mm. longae. Pedicellus cum ovario 5—8 mm. longus. Sepala extus pubescentia, lateralia, ± 4 mm. longa, late ovata, asymmetrica, obtusa, dorsale valde cucullatum, circiter 4 mm. longum. Petala oblanceolata, obtusa, 3-nervia, 3.5—4 mm. longa, circiter 2 mm. lata. Labellum rotundatum, trilobatum, 5 mm. longum, 6.5—7 mm. latum, vix unguiculatum. Lobi laterales 2 mm. longi, obtusi. Lobus medius perlate reniformis, retusus, apiculatus, 2 mm. longus, 4.5 mm. latus, margine denticulate. Calli 6, ad basim labelli 3-tubercula quorum medium longius, ad apicem labelli tuberculum permagnum 3 mm. longum, farinosum, in disco prope sinum utrinque callus complanatus, truncatus. Columna minuta.

The shorter bracts, the apical and much larger callus, the broader leaves and longer racemes distinguish this species from *E. davaensis Ames*, its nearest ally. The terminal callus is quite remarkable on account of its extraordinary size and passes into a central keel which extends to the base of the lip.

Island of Sibuyan: Province of Capiz, Magallanes (Mt. Giting-giting), April, 1910, *A. D. E. Elmer*, 12271.

Small tufts on the upper side of an inclined moss covered tree trunk extending across or over the Patoo river at 750 feet altitude, 20 feet from the edge of the water. Rhizome rigid, tough, short, freely rebranched; stems ascending, ensiform, flexible, pale green; leaves ascending or horizontal, flat or only shallowly folded on the upper side toward the base; spikes two, ascending, the terete rachis and reflexed bracts pale green; flowers divaricate, lateral wings of the lip spotted with purple, otherwise pale or melleus yellow.

Eria palawanense sp. nov.

Caules abbreviati, bracteis chartaceis absconditi, monophylli, cylindracei, $\underline{\times}$ 6 cm. alti, circiter 5 mm. in crassitudine. Folia linearia, glabra, circiter 3 dm. longa, 7—8 mm. lata, ad apicem inaequaliter bilobata, acuminata, acuta, pedunculo multo longiora. Pedunculus lateralis, erectus, sparsim pubescens, pauci-vaginatus, circiter 8 cm. longus, pauciflorus. Pedicelli graciles, cum ovario 7.5 mm. longi, pubescentes. Bracteae inflorescentiae pedicello breviores, lanceolatae, 2.5 mm. longae, ciliolatae. Flores albidi. Sepala lateralia circiter 5 mm. longa, ovata, asymmetrica, mentum 3 mm. longum, obtusum formantia. Sepalum dorsale oblongi-ellipticum, obtusum, fere 5 mm. longum, 3 mm. latum. Petala oblongi-lanceolata, fere 6 mm. longa, 3 mm. lata, 5-nervia, obtusa. Labellum ovatum, obtusum, concavum, cymbiforme, ad basim saccatum, 5 mm. longum circiter 3.5 mm. latum, lamellis 2 intra-marginalibus. Columna petalo brevior.

The labellum of *E. palawanense* is generally ovate in outline. At the base it forms, with the foot of the column, a distinct cup or sac. From the base to about the middle, one on each side, two falcate lamellae extend, gradually dilated toward the truncate tip and are fastened to the disc of the lip near their inner margin. The point of attachment seems to be indicated by longitudinal nerves. Unfortunately the material at hand is not supplied with very good flowers.

Island of Palawan: Province of Palawan, Puerto Princesa (Mt. Pulgar), May, 1911, *A. D. E. Elmer*, 13209.

At 4000 feet up the mountain, in dense mossy woods.

Eria Ramosii Leav. in Philip. Journ. Sci. (Bot.) IV; 224.

This curious and rare species, known heretofore only from the specimens in the herbarium of the Bureau of Science and in my herbarium has been rediscovered by *Mr. Elmer* on the Island of Negros. So far as known it has no near ally in the Philippines.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), April, 1908, *A. D. E. Elmer*, 9803.

Forming dense soft mats upon large tree trunks or on the upper side of large limbs of lofty trees, on a ridge 4000 feet above sea level. Root slender, numerously branched and forming a loose matrix; stems reclining in all directions, green, terete, from 1 to 5 inches long; leaves soft, rather thick and succulent, in distichous rows, tips slightly recurved, flat on the upper side, convex beneath; flowers solitary or occasionally in pairs, subpendulous, soft, light yellow throughout; capsules green, rather persistent.

Eria ringens Reichb. f. in Bonplandia III; 222.

The identity of *Eria ringens Reichb. f.* is not positively known. That *Reichenbach* based his description on a Philippine plant collected by *Cuming* is clear from his reference to *Cuming's* 2128. *Leavitt* in his paper "The Genus *Eria* in the Philippines," arrived at no clear understanding of *E. ringens*, and although he studied several specimens bearing the type number he refrained from making any positive statement and left the matter unsettled. At Kew on the same sheet which bears the type of *Eria polyura Lindl.*, a Philippine specimen is mounted which has been given the number 2128. A sketch of a flower from this specimen is in my possession and which shows a lip very similar to that of *Elmer* 10192. Relying on this sketch and on a clear photograph of the *Cuming* plant I am inclined to regard *Elmer's* plant conspecific with it. If the *Cuming* plant is *E. ringens*, then I believe we may so regard *Elmer's* plant. The *Cuming* plant (No. 2128) preserved in the British Museum of Natural History, from notes which I have and from photographs, appears to be the same species as that mounted on the type sheet of *E. polyura*. Both *Cuming's* plants have shorter racemes than *Elmer's* No. 10192, and in this respect exhibit the only material difference which, with the data at my command, I am able to detect. A puzzling element in the study of this subject is *Reichenbach's* remark that *Eria retroflexa Lindl.* repeats *E. ringens*. Excepting *E. ringens*, *Elmer's* 10192 appears to be unlike all other Philippine species heretofore described.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), May, 1909, *A. D. E. Elmer*, 10192.

Eria tridens sp. nov.

Aff. *E. cymbiformi J. J. Sm.* Caules abbreviati, 4.5—6 cm. longi. Folia elongata, linearia, circiter 3.6 dm. longa, circiter 1.8 cm. lata, petiolata, ad basim longe attenuata, ad apicem bilobata, nerviis subtus 5 prominentibus, lobi acuti. Vaginae equitantes, 2—4 cm. longae, conduplicatae. Pedunculi, foliis breviores, circiter 1 dm. longi, densi-multiflori, lanuginosi. Racemi usque ad 6.5 cm. longi, rhachidi pubescente. Bracteae inflorescentiae, rigidae, cymbiformes, acutae, pubescentes plus minus 5 mm. longae, persistentes. Flores congesti color non in specimene sicco apparens. Sepala lateralia ad pedem gynostemii decurrentia mentum saccatum obtusum formantia, semiovata, obtusa circiter 5 mm. longa, 6 mm. lata, extus disperse pilosa. Sepalum dorsale oblongi-ellipticum, subacutum, circiter 5 mm. longum, 3 mm. latum, concavum, extus disperse pilosum. Petala oblongi-lanceolata, obtusa, 3-nervia, usque ad 5 mm. longa, 2 mm. lata. Labellum 5 mm. longum, erectum concavo-cymbiforme, basi fere saccatum, apice breviter fere aequaliter 3-dentatum; dentes acuti vel subacuti, 1 mm. longi. Calli 2, prope medium labelli. Sacculus obtusus, 1.5 mm. longus. Gynostemium breve.

E. tridens, as represented by the material at hand, is a smaller species than *E. cymbiformis*, recognizable by the calli of the labellum which are situated well below the middle. In the specimens examined I was unable to detect a middle callus or keel near the base of the labellum. *Eria ventricosa Leav.* resembles *E. tridens* in the form of the labellum and in the number and position of the calli, but in detail the following differences are observable; the apical lobing of the labellum is more tooth-like in *Eria tridens* and the calli are truncate at the apex.

Mindanao: District of Davao, Todaya (Mt. Apo), September, 1909, *A. D. E. Elmer*, 11850^a.

PHREATIA Lindl.

Phreatia Elmeri sp. nov.

Caulis elongatus, pluriarticulatus, folia disticha, longe vaginantia. Racemi laterales, pluriflori. Caules circiter 15 cm. longi, usque ad 3 mm. in crassitudine, simplices, laxe foliati, vaginis foliorum dejectorum et viventium tecti. Folia lineari-oblonga, subfalcata, obtuse et inaequali biloba, coriacea, usque ad 8 cm. longa, circiter 7 mm. lata. Racemi graciles, folia excedentes. Flores circiter 2 mm. distantes. Bracteae inflorescentiae lanceolatae, 2—2.5 mm. longae, ovaria pedicellata aequantes. Sepala lateralia ovato-lanceolata, obtusiuscula, 1.5 mm. longa. Sepalum dorsale simile. Petala lanceolata, circiter 1 mm. longa. Labellum orbicularis, subapiculatum, concaviusculum, 1.25 mm. longum. Gynostemium brevissimum.

Phreatia Elmeri is a near ally of *P. caulescens Ames* from which it is readily separable by its smaller more crowded flowers. *P. caulescens* is only known from specimens collected in Luzon.

Mindanao: District of Davao, Todaya (Mt. Apo), May, 1909, *A. D. E. Elmer*, 10622.

Found growing in loose tufts, hanging from moss covered tree trunks in a forested ridge 6000 feet above sea level on Mt. Calelan. Stems decurved, the ends suberect, terete, not rigid; leaves much paler green beneath than above, recurved, coriaceous, not rigid; peduncles from the axils of the upper leaves, yellowish green, terete, limp, horizontally spreading; flowers white.

Phreatia luzoniensis Rolfe ex *Ames* Orchidaceae I; 96.

This is a very near relative of *Phreatia secunda Lindl.* (*P. microtidis Lindl.*) and in herbarium specimens well nigh indistinguishable from it. No reliance can be placed on the comparative lengths of the inflorescence and leaves, in distinguishing these species apart, as *Mr. Rolfe* was led to believe. *Schlechter's* No. 15893 from Sumatra distributed under the name *Phreatia secunda Lindl.* resembles very closely the Philippine material referable to *P. luzoniensis Rolfe*. *P. microtidis*, which *J. J. Smith*

regards as conspecific with *P. secunda Lindl.*, is represented in *Lindley's* herbarium by a single plant and a sketch of a flower and a lip. If any reliance can be placed on *Lindley's* sketch the lip of *P. microtidis* is unlike the lip of *P. luzoniensis*, being orbicular, concave-pandurate as originally described, but hardly answerable to *Mr. Smith's* description in "Die Orchideen von Java." Whatever the final conclusion in this matter may be it is clear that geographical limitations are perhaps the most indicative at this time of the proper place to draw the lines of segregation.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), June, 1908, *A. D. E. Elmer*, 10252.

Small tufts attached to coarse bark of hard wood trees in a deep moist ravine at 2500 feet altitude.

Phreatia negrosiana sp. nov. (§ *Euphreatia.*)

Herba minutissima, pedunculus multo folium excedens. Pseudobulbi nulli, caules valde abbreviati, complanati, circiter 1 cm. longi. Folia disticha valde coriacea, circiter 2.5 cm. longa, 3 mm. lata, ad basim articulata, oblongi-lanceolata, obtusa, falcata, margine irregulariter denticulato, diaphano. Pedunculus 7 cm. longus, gracilis erectus, infra racemum bracteatus, bracteis subinfundibuliformibus ± 4 mm. longis. Racemi circiter 4 cm. longi. Bracteae lineari-lanceolatae, acuminatae, acutae, circiter 2 mm. longae. Flores in siccitate albidi, minutissimi, circiter 2 mm. in diametro. Sepala lateralia, ovato-lanceolata, acuta, usque ad 1 mm. longa. Sepalum dorsale, simile, acutum vel obtusum. Petala linearia, obtusa, 1-nervia, sepalis multo angustiora. Labellum unguiculatum, vix 1 mm. longum, 3-nervium, dilatatum, parte dilatata cordata vel late ovata, rotundata. Columna minuta.

Phreatia negrosiana is closely related to *P. luzoniensis Rolfe*, from which it is clearly separable by its elongated, slender inflorescence. It is also near *P. minutiflora Lindl.*

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), May, 1908, *A. D. E. Elmer*, 10148.

BULBOPHYLLUM Thou.

Bulbophyllum alsiosum sp. nov.

Rhizoma longe repens, flexuosum, flavidum, bracteis vaginantibus obtectum, ad nodos radicans. Pseudobulbi ± 2 cm. longi, angustati, cylindracei, 5—9 cm. remoti, vaginis inflatis, laxis, tubularibus absconditi, monophylli. Folia oblongi-elliptica, acuta, ad basim attenuata in petiolum gracilem angustata; lamina 13 cm. longa, 4 cm. lata, coriacea, infra nunquam purpureo-striata; petiolus sulcatus, 3 cm. longus. Scapus circiter 2.5 cm. longus, bracteatus bracteis vaginantibus, imbricantibus obtectus. Flores solitarii, circiter 2.3 cm. longi. Sepala lateralia supra medium conduplicata, carinata, oblongi-lanceolata, obtusa, infra medium explanata mentum obtusum formantia, circiter 2 cm. longa, 7-nervia. Sepalum dorsale 2.2 cm. longum, lanceolatum, obtusum, carinatum, concavum vel conduplicatum, circiter 1 cm. latum. Petala late ovata, subacuta, 7-nervia, 1.3 cm. longa, 9 mm. lata. Labellum crassum, rigidum, lingulatum, 1.5 cm. longum, superne sulcatum, obtusum, ad apicem valde incrassatum, scabratum, prope basim carinatum. Columna crassa ad apicem integerrima.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), April, 1908, *A. D. E. Elmer*, 9817.

Creeping upon moss covered tree trunks at 4000 feet altitude. The outer three floral organs greenish on the outside, deep purple on the inside, as are also the inner organs; flowers odorless.

Bulbophyllum lancifolium sp. nov.

Rhizoma repens, Pseudobulbi nulli. Folia remota, utrinque acuta, acuminata, lanceolata vel ligulato-lanceolata, petiolata, coriacea Petiolus gracilis, Scapus gracilis bracteis tubularibus. Bracteae inflorescentiae lanceolatae, acuminatae, acutae. Flores flavidi in racemo laxo. Sepala lateralia late triangularia, acuta, 3-nervia. Sepalum superius valde concavum, oblongi-lanceolatum, acuminatum, acutum, petalis multo longius. Petala lanceolata prope apicem contracta, acuminata, acuta, cellulari-ciliata, aliquid crassa. Labellum lingulatum obtusum, crassum, 3-nervium, margine cellulari-ciliato, et ciliato; lamellis 2 intramarginalibus. Columna brevis, bicuspidata.

Leaves 2—3 cm. apart, petiolate. Lamina ± 1.5 dm. long, 1.5—1.8 cm. wide, tapering gradually to both ends, chartaceous when dry, coriaceous in living specimens, many nerved with a conspicuous mid-nerve, apex sharp pointed. Petals 2—5 cm. long, slender. Scape about equalling the leaf in length, up to 1.5 dm. long with several lanceolate and acute bracts below the inflorescence. Raceme about 12-flowered, nearly 1 dm. long. Pedicel and ovary short, shorter than the lanceolate bracts. Bracts of the inflorescence about 5 mm. long. Lateral sepals 7 mm. long, about 3 mm. wide near the base. Upper sepal equalling the laterals but narrower. Petals 3.5 mm. long, lanceolate, abruptly contracted at about the middle into an acuminate, cellular-ciliate tip, 1-nerved. Labellum lingulate, about 4 mm. long, sharply deflexed at about the middle, margin erect at base, margin at the apex cellular-ciliate and long ciliate; at the point where the apical half is deflexed two inconspicuous intra-marginal lamellae are situated.

Although a near relative of *D. dasypetalum*, *B. lancipetalum*, etc., *B. lancifolium* is easily recognized by its acuminate, acute leaves.

Mindanao: District of Davao, Todaya (Mt. Apo), August, 1909, *A. D. E. Elmer*, 11352.

Found in loose clusters upon moss covered tree trunks 7750 feet above sea level. Stems grayish white, terete, branched and forming a matrix.

Bulbophyllum longipetiolatum sp. nov.

Radices densae. Rhizoma crassum, lignosum. Pseudobulbi nulli. Folia longipetiolata, lamina ligulata, coriacea, oblongi-lanceolata, obtusa, leviter recurvata, in sicco flexuosa, petiolus elongatus, gracilis, subteres, erectus. Scapus longus, gracilis ad basim bracteis tubularibus instructus. Flores flavidi in racemo laxo. Bracteae inflorescentiae lineares, scariosae, acuminatae, acutae, pedicillo cum ovario longiores. Sepala lateralia triangulari-lanceolata, acuta, 3-nervia. Sepalum superius simile. Petala sepalis breviora, lanceolata. Labellum lingulatum, 3-nervium, lamellis 2 intramarginalibus. Columna breviter bicuspidata.

Rhizome elongated, copiously rooted, bearing 1.5—2 cm. apart, long-petioled, ligulate leaves. Petioles 1—1.3 dm. long. Lamina 2—2.2 dm. long, 3 cm. wide. Scape ± 3 dm. long, closely sheathed at base by about 4 ancipitous bracts. Raceme loosely many flowered, about 2.5 dm. long. Bracts subtending the flowers ± 5 mm. long. Lateral sepals 4.5 mm. long, 3 mm. wide at the base. Upper sepal about equal to the laterals but narrower. Petals 2 mm. long. Labellum 3 mm. long.

B. longipetiolatum is closely related to *B. dasypetalum Rolfe* and to *B. gibbosum Lindl.* From the former it is readily distinguishable by its smaller flowers and very characteristic foliage.

Mindanao: District of Davao, Todaya (Mt. Apo), June, 1909, *A. D. E. Elmer*, 10883.

Growing in clumps on large oak trees in humid woods at 4000 feet above sea level, north of the Baruring river. Rootstock branched; petioles subterete, green, ascending; leaf blades thickly coriaceous, only slightly recurved and conduplicate; inflorescence ascending.

Bulbophyllum mindanaense sp. nov.

Rhizoma repens. Pseudobulbi 0. Folium crassum, coriaceum, elliptico-lanceolatum, cum petiolo, 39—49 cm. longum, 5—8.7 cm. latum, costa media supra sulcata, subtus obtuse carinata. Petiolus elongatus, sulcatus 15—20 cm. longus, rigidus. Scapus elongatus, gracilis, plus minus 7 dm. longus, prope basim vaginatus. Racemus gracilis elongatus, multiflorus. Flores crassi minuti. Bracteae inflorescentiae plus minus 4 mm. longae, lineares, acutae. Sepala lateralia ovato-oblonga crassa, obtusa, 2.5 mm. longa, 2 mm. lata, ad apicem cucullata et inflata. Sepalum dorsale, oblongi-lanceolatum, 3 mm. longum. Petala 1.5 mm. longa, 0.5 mm. lata, oblonga, 1-nervia, obtusa, apiculata, prope basim attenuata. Labellum minutum, oblongum, crassum valde arcuatum, obtusum 1 mm. longum. Columna minuta, bialata, alis lanceolatis, 1 mm. longa.

B. mindanaense differs from the other Philippine species of § *Racemosae* in its large, long-petioled leaves, elongated scape and minute flowers. According to *Mr. Elmer's* field notes this species grows in clumps on the limbs of lofty trees in humid forests at 3750 feet above sea level. The flowers are described as lemon yellow with a slight fragrance.

Mindanao: District of Davao, Todaya (Mt. Apo), August, 1909, *A. D. E. Elmer*, 11307.

Forming clumps upon limbs of large trees in damp woods at 4000 feet. Rootstock short branched, nearly one half an inch thick, rigid, yellowish; leaves thick and rigidly coriaceous, ascending, folded toward the green and rigid petioles, somewhat paler green beneath; peduncle lateral, flattened and provided with yellowish green flattened bracts; spike terete, strongly recurved toward the tip; flowers rigid with a slight odor.

Bulbophyllum negrosianum sp. nov.

Aff. *B. lasioglosso.* Pseudobulbi 2.5 cm. longi, lageniformes, vel pyriformes, sensim attenuati, monophylli. Folium petiolatum, cum petiolo circiter 2 dm. longum, fere 4 cm. latum, coriaceum, oblongum, vel oblongi-lanceolatum. Scapi elongati, graciles, e basi pseudobulborum oriundi, aphylli, racemo sublaxo, usque ad 4 dm. longi, bracteis vaginantibus vestiti. Bracteae inflorescentiae minutae, circiter 1 mm. longae. Racemi circiter 1.5 dm. longi. Pedicellus abbreviatus, valde arcuatus cum ovario circiter 4 mm. longus. Sepala lateralia purpurea, oblongi-lanceolata, circiter 6 mm. longa, usque ad 2.5 mm. lata, 3-nervia, acuta, membranacea, glabra. Sepalum dorsale oblongi-lanceolatum, acutum, margine dense piloso pilis patentibus, 6 mm. longum, concavum. Petala lineari-lanceolata, 1-nervia, circiter 3 mm. longa, 1.5 mm. lata, pilosa. Labellum circiter 4 mm. longum, 3-lobatum. Lobi laterales parvi, rotundati; lobus medius lanceolatus 2.5 mm. longus, 2 mm. latus, 5-nervius. Ad basim labelli callus orbicularis. *Columna* simplex, calyptra antherae peniciliis duobus instructa.

This is a very near ally of *Bulbophyllum lasioglossum Rolfe.* The smaller different colored flowers (those of the older species being greenish-white with a blackish lip) and the shorter pedicels are among the most evident distinctions. *Elmer* described the flowers as follows: "Dull purple except the whitish purple streaked uppermost segment and the brown versatile or quivering lowermost segment." In *Bulbophyllum lasioglossum* the basal callus

is very similar to that of the present species.

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), April, 1908, *A. D. E. Elmer*, 9821.

On reclining tree trunks of mossy woods at 4250 feet above sea level, forming rather loose but dense tufts. Pseudobulbs green and not rigid; leathery dark green foliage descending, flat, caniculate on the upper side toward the base.

Bulbophyllum sibuyanense sp. nov.

Rhizoma repens, gracilis. Pseudobulbi remoti, tetragoni, 15—18 mm. longi, rugosi, monophylli. Folium ligulatum, oblongum, obtusum, coriaceum, petiolatum, 8—10.2 cm. longum, 1.3—1.4 mm. latum. Petiolus circiter 1 cm. longus, sulcatus, rigidus. Scapus erectus, gracilis. Flores purpurei, racemo in umbellam contracto. Pedicelli 5 mm. longi, graciles. Sepala lateralia 1.8—2 cm. longa, supra basim fere ad apicem connata, in laminam cohaerentia. Lamina circiter 4 mm. lata, anguste lanceolata. Sepalum superius ovato-lanceolatum, acuminatum, circiter 5 mm. longum, fimbriatum, in caudam filiformem constrictum. Petala lanceolata, acuminata, circiter 4 mm. longa, fimbriata, in caudam filiformem constricta. Labellum lingulatum, valde arcuatum, obtusum, 2 mm. longum. Columna minuta, superne 2-alata, alis in brachium truncatum erectum producta.

The pseudobulbs in this species are on the average 3 cm. apart. The flowers are whitish and purplish with the labellum shiny yellow, according to notes made by *Mr. Elmer. B. Cumingii Reichb. f.* is a closely allied species from which *B. sibuyanense* is to be distinguished by its smaller flowers and narrow leaves.

Island of Sibuyan: Province of Capiz, Magallanes (Mt.. Giting-giting), April, 1910, *A. D. E. Elmer*, 12140.

On trunk of a small tree in humid woods on the gravelly stream bank of the Pauala river at 1250 feet above sea level. Rootstocks dry and pliable; pseudobulbs yellowish green, scattered along the rhizome, terminated by a thickly coriaceous ascending leaf blade which is somewhat paler beneath than above; scape arising from the base of the pseudobulb, slender, brownish; inflorescence a half horizontal umbel; flowers delicate,

odorless, upon yellowish brown ascending pedicels; petals whitish toward the apex, dotted with purple toward the base, the inner recurved organ shiny yellow.

TAENIOPHYLLUM Blume.

Taeniophyllum Elmeri sp. nov.

Epiphyticum, subacaule; radicibus, numerosissimis, flexuosis, applanatis, usque ad 11 cm. longis, 3 mm. latis; caule subnullo, aphyllo; scapus gracillimis usque ad 6 cm. longis, papilloso-puberulis, vaginulis 1-2, distantibus parvulis. Inflorescentia usque ad 1.7 cm. longa, rhachis fractiflexa. Bracteae vix 1 mm. longae, rigidae, acutae, glabrae. Flores circiter 12 in racemo laxo. Pedicellus glaber, cum ovario circiter 3 mm. longus. Sepala lateralia lanceolata, acuminata ad apicem conduplicata, acuta, circiter 2.5 mm. longa, 1-nervia. Sepalum dorsale simile. Petala fere 2.5 mm. longa, 1-nervia, lanceolata, acuminata prope basim cum sepalis connata. Labellum calcaratum, simplex, ovato-lanceolatum, concavum, ad apicem conduplicatum. Calcar scrotiforme 1.5 mm. longum. Gynostemium brevissimum.

The flowers resemble in the outline of the sepals and petals flowers of *T. arachnites J. J. Sm.*

Island of Negros: Province of Negros Oriental, Dumaguete (Cuernos Mts.), June, 1908, *A. D. E. Elmer*, 10336.

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DIOSCOREAE ELMERIANAE

A contribution to our knowledge of the genus *Dioscorea* in the Philippine Islands

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The following pages are to be regarded as a supplement to a paper on the genus *Dioscorea* which will appear in the Journal of the Asiatic Society of Bengal. In the paper referred to, we have enumerated all the species of this genus which are known to us as occurring in the Old World, Africa excepted; and we have described a dozen new species, but not those collected by *Mr. Elmer* in the Philippine Islands which have been reserved for his Leaflets. *Mr. Elmer's* are six in number. One of them is *D. flabellifolia*,—a representative apparently of the northern section *Stenophora:* two are species of the section *Lasiophyton,*—which shows a great tendency to give rise to new forms in the Philippine Islands: one is an ally of the *D. luzonensis*—an outstanding member of the section *Enantiophyllum:* and the other two are segregates of *D. nummularia,* which is the eastern representative of the western Malayan *D. pyrifolia*. The section *Stenophora*, which is centered in the Northern Hemisphere on both sides of the Pacific, in subtropical regions, only just reaches the plains of Northern India, and does in no way penetrate into the peninsula of the Deccan, nevertheless it passes southwards into the Malayan region, being represented by *D. flabellifolia* in the Island of Luzon, by *D. Ridleyi* in Borneo, by *D. cambodiana* in Cambodia, by *D. daunaea* in Tenasserim, and by *D. membranacea* and *D. birmanica* in the southern part of the Indo-China region. These tropical representatives of the subtropical section have characters in common, but it is much to be regretted that we know only one sex of most of the species. Of *D. flabellifolia* this is the case, the female being unknown. The section *Combilium* seems to be centered in the Philippine Islands, its only species—*D. aculeata,*—occurring very commonly in the islands in a wild state. The sections *Lasiophyton* and *Enantiophyllum* furnish local species, such as may be regarded as segregates of local origin. It is interesting that the islands should appear to be more distinctly a focus for the genesis of species than the large islands of western Malaya.

A complete list of *Dioscoreas* so far found in the Philippine Islands is as follows:—

Section *Stenophora*

D. flabellifolia, *Prain & Burkill*. In Luzon.

Section *Combilium*

D. aculeata, *Linn*. (1754, not 1753).
  var. *tiliaefolia*. In several, perhaps most of the islands.
  var. *fasciculata*. In Luzon.

Section *Lasiophyton*

D. pentaphylla, *Linn*.
  var. *malaica*. In Luzon.
D. Elmeri, Prain & Burkill.

var. vera. In Luzon.
var. *dubia*. In Luzon.

D. inaequifolia, *Elmer*. In the islands south of Luzon.

D. Cumingii, *Prain & Burkill*. In Luzon.

D. triphylla, *Linn*. (1754, not 1753).
var. *reticulata*. Probably in all the islands.
var. *mollissima*. In Mindanao.

Section *Opsophyton*

D. bulbifera, *Linn*.
var. vera. Apparently in all the islands.

Section *Enantiophyllum*

D. luzonensis, *Schauer*. In Luzon and Palawan.

D. peperoides, *Prain & Burkill*.
var. vera. In Luzon.
var. *sagittifolia*. In Luzon.

D. Loheri, *Prain & Burkill*. In Luzon.

D. Soror, *Prain & Burkill*.
var. vera. In Luzon.
var. *glauca*. In Luzon.

D. Foxworthyi, *Prain & Burkill*. In Luzon.

D. nummularia, *Lamk*.
var. vera. Apparently in all the islands.
var. *glauca*. In Luzon.

D. Merrillii, *Prain & Burkill*. In the islands south of Luzon.

D. grata, *Prain & Burkill*. In Luzon.

D. myriantha, *Kunth*. Probably in all the islands.

D. alata, *Linn*.
var. vera. Apparently cultivated throughout the islands.

The *Linnaean* names of the species of *Dioscorea* are very confused. *Linnaeus*, with the touch of a master, defined the genus, and brought together the species composing it: but it otherwise fared badly at his hand. He applied the names *D. aculeata*, *D. triphylla*, and *D. sativa*, now to one species now to another; and the result is perplexing. His *D. aculeata* of 1753 was a muddled drawing in *Rheede's* Hortus Malabaricus, a confusion of *D. bulbifera* with *D. Wallichii*, but in 1754 he gave the name to the "*Combilium*" of *Rumpf's* Herbarium Amboinense. In 1763 he returned to *Rheede's* figure, but again in 1788 went back to *Rumpf's*. The botanists who immediately followed him kept alive the second view, which has never indeed been quite lost sight of in the years to date. Discarding the muddled drawing in the Hortus Malabaricus, we use the name "*aculeata*" in the way in which *Linnaeus* used it in 1754.

In 1753 *Linnaeus* used the name "*triphylla*" for a plant which is no more than a condition of *D. pentaphylla*; but in 1754 he used it for the Gadoeng of the Malays, as satisfactorily figured by *Rumpf*. In 1763 he returned to his first position, adding the remark that perhaps *D. triphylla* might be no more than a variety of *D. pentaphylla;* but in 1788 he came back to the second position. *Jacquin* and *Lamarck* followed him in this second view, which, the first use of the name being unwarranted, we regard as the one justified.

The name "*sativa*" was used first by *Linnaeus* for an American plant which he found in the garden of *Clifford*. *Ehrhardt* drew it for him adding the capsules from a dried plant, as *Clifford's* plant had not flowered. But he quoted as being the same, a reference to the *D. aculeata* of the Old World. The American plant is to be regarded as the original *D. sativa*; but *Linnaeus* in the course of time added under it no less than five other species, and his immediate followers were so misled, as to add more: one of the species added was *D. bulbifera*. By reason of that, *Bentham* and some other botanists have given the name "*D. sativa*" to *D. bulbifera:* but fortunately there is no doubt regarding *Linnaeus'* use of the name "*bulbifera*" which must be applied, as we

apply it here, to a very common oriental plant, and one of the first of *Dioscoreas* to fall into the hands of European botanists.

The following are the species which *Mr. Elmer* has collected, and the examination of which we owe entirely to his kindness.

Section **Stenophora**

Dioscorea flabellifolia.

Tuber vel rhizoma ignotum. Caules minute aculeati, aculeis ad basin foliorum majoribus, glabriusculi, ad 4 mm. diametro, sinistrorsum volubiles. Folia late cordata, acuminata, ad 13 cm. longa, ad 14 cm. lata, supra glabra, infra glabrescentia, 9–nervia: area media a nervorum lateralium pare primo terminata oblanceolato elliptica: venae secondariae trajectae fere rectae: petiolus puberulus, deinde glabrescens, ad 9 cm. longus. Flores masculi ad 60 in racemibus 2—4-natis axillaribus spiciformibus producti: axis ad 25 cm. longus, puberulus: pedicelli 5 mm. longi: bracteae lanceolatae, acutae, puberulae, 3 mm. longae, supra pedicelli basin insidentes. Perianthium crateriforme: tubus brevis: lobi in anthesin recurvi, lanceolati, supra bicarinati, 1.5 mm. longi, interiores quam exteriores paululo rectiores. Stamina 6, ad bases perianthii loborum inserta, biseriatim dehiscentia: filamenta 0.5 mm. longa: antherae introrsae. Flores foeminei ignoti.

Insula Luzon. Ad Lucban in provincia Tayabas, *Elmer*, 9095.

D. flabellifolia, *Prain & Burkill*, dum forma rhizomatis vel tuberis et capsularum ignotae, affinitas incerta manet, sed ob perianthium inter *Stenophoras* ponenda est.

Section **Combilium**

Dioscorea aculeata, Linn. Systema, (1788), p.......; et. Amoen. Acad., (1754), p......., (nec in Sp. Plant.): *Lamk.*, Encyclop. Meth., III. (1789), p. 232; *Loureiro,* Flor. Cochinch., I. (1790), p. 625: *Miquel*, Flor. Ind. Bat., III. (1855), p. 575, in part: *Seemann*, Fl. Vitiensis, (1873), p.......: *Safford* in Contrib. U. S. Nat. Herb. XIV. (1905), p. 68.

var. **tiliaefolia.** *D. tiliaefolia*, *Kunth*, Enum., v. (1859), p. 401: *Miquel*, Flor. Ind. Bat., III. (1855), p. 576: *Ceron*, Cat. Herb. Comis. Flor. Forest., (1892), p. 171: *Koorders*, in Mededeel. van s'Lands Plantentuin, XIX. (1898), p. 313. *D. tugui*, *Blanco*, Flor. Filip., (1837), p. 800: *Merrill*, Rev. Sp. described in *Blanco's* Flor. Filip., (1905), p. 87. *D. papuana*, *Warburg*, in *Engl.* Bot. Jarhb., XIII. (1891), p. 273. *D. tredecimnervis*, *Pierre*, ms.

Folia magna, ad 17 cm. lata, sæpe 13-nervia, pubescentia. Flores producit; at adhuc fructus ignoti. Tubera claviformia, in terram infra radices spinosissimos descendentia.

Insula Luzon. In monte Twin-peaks dicto provinciae Benguet, *Elmer*, 6421. Ad Lucban in provincia Tayabas, *Elmer*, 9095.

Insula Negros. Ad Dumaguete in montibus Cuernos, *Elmer*, 10293.

Section **Lasiophyton**

Dioscorea Elmeri.

Tubera ignota. Caulis aculeatus, pilis rufis dense tectus deinde aliquo modo glabrescens, sinistrorsum volubilis. Folia alterna: foliola ad 8, ovata vel ovato-elliptica, coriacea, supra glabrescentia, infra ad nervos rufo-pubescentia, basi obtusa vel rotundata, apice obtusa breviter acuminata: foliolum medium ad 18 cm. longum, ad 8 cm. latum, penninerve venis lateralibus septem: foliola altera minora, extrema asymmetrica: petiolus ad 10 cm. longus dense pubescens: petioluli 8-12 mm. longi. Flores foeminei in spicis simplicibus pendulis ad 26 cm. longis solitarii vel bini compositi: axis dense rufo-pubescens. Sepala lanceolato-ovata externe rufo-pubescentia. Petala minora, glabra. Capsulae reflexae, aliquo modo imbricatae, dense rufo-pubescentes: alae 25 mm. longae, ad medium 10 mm. latae. Semina unilateraliter alata: ala fumosa.

Insula Luzon. Ad Los Baños in provincia Laguna, *Elmer*, 8265. Ad Lucban in provincia Tayabas, *Elmer*, 9156.

Species haec a *Dioscorea pentaphylla*, *Linn.*, differt capsulis pilisque.

Dioscorea inaequifolia, Elmer, ms.

Tubera ignota. Caulis aculeatus, pilis rufo-brunneis pubescens. Folia alterna: foliola ad 7, herbacea, anguste obovato-elliptica vel elliptica, basi acuta, apice acuminata, supra glabra, infra juniora pilis albis parce pubescentia deinde glabrescentia: foliolum medium ad 14 cm. longum, ad 5 cm. latum, penninerve venis lateralibus sex vel septem: foliola altera minora extrema asymmetrica: petiolus ad 15 cm. longus, parce aculeatus vel sine aculeis, glabrescens: petioluli ad 10 mm. longi juniores pilis albis pubescentes deinde glabrescentes. Flores masculi ignoti. Flor foeminei ad 30 in spicis simplicibus pendulis compositi: axis pilis albis pubescens: bracteae ovato-lanceolatae, acuminatae, pilis albis pubescentes, 2 mm. longae. Sepala triangulari-ovata, 1.5 mm. longa. Petala similia, minora. Capsulae horizontales, pilis albis parce pubescentes, deinde glabrescentes: pediculus 3 mm. longus: alae 36 mm. longae 12 mm. latae, apice retusae, basi truncato-rotundatae. Semina unilateraliter alata: ala fumosa.

Insula Mindanao. Ad Todaya in Monte Apo, districtus Davao, *Elmer*, 10654.

Species haec capsulis horizontalibus a *Dioscorea Cumingii, Prain & Burkill*, facile distinguitur.

Dioscorea Cumingii, Prain & Burkill in Journ. Asiatic Soc. Bengal, IV. (1908), p. 449.

Insula Luzon. Ad Baguio in provincia Benguet, *Elmer*, 8692.

Dioscorea triphylla Linn., Amoen. Acad., (1754), p......; et Systema, (1788), p......: *Jacquin*, Collect. II. (1788), p. 365: *Lamk.* Encyclop. Meth., III. (1789), p. 234, in part: *Jacquin*, Ic. Plant. Rar., III. (1790), p. 627: *Merrill*, Review Species described in *Blanco's* Flor. Filip., (1905), p. 86. *D. hirsuta*, *Roth*, Novae Plant. Spec., I. (1827), p. 214: *Warburg*, in *Engl.* Bot. Jahrb., XIII. (1891), p. 273: *Merrill*, Dict. Plant Names, (1903), p. 144. *D. daemona*, *Roxb.* Hort. Beng., (1814), p. 72: et Flor. Ind., III. (1832), p. 805: *Hooker f.*, Flor. Brit. Ind. VI. (1892), p. 289: *Ridley*, Mat. Flor. Malay Penins., II. (1907), p. 89.

var. **reticulata Hook. f.** l. c.

Folia admodum crassa, pilosa, rufa.

Insula Luzon. In monte Twin-peaks dicto provinciae Benguet, *Elmer*, 6361. Ad Lucban in provinciae Tayabas, *Elmer*, 9131.

var. **mollissima.**

D. mollissima, *Blume*, Enum. Plant. Jav. I. (1827), p. 21. Flores masculini albo-tomentosi.

Insula Mindanao. Ad Cabadbaran in monte Urdaneta, provinciae Agusan, *Elmer*, 13508.

The following is taken from *Elmer's* field notes.—Scandent and sprawling over wooded jungles along a fertile stream bank at 250 feet altitude; stems few from the same root-cluster, terete, 1 inch thick at the base, subglaucous and sharply spinescent, the greenish tissue sweetish but without odor; roots from all sides of the tubercles which form clusters of individuals from 1 to 5 inches in diameter; these individuals are yellowish, subglobose or truncate at the base and conically tapering; branches repeatedly branched, long, drooping, subtwining, terete, green, tough; leaves diverse in size, the petioles swollen and twisted at the base; leaflets drooping and membranous, paler green beneath. "Mayay" is the Manobo name. The natives utilize the tubers for food. Clusters 2 feet across are fairly well scattered to the surface of the ground.

Section **Opsophyton**

Dioscorea bulbifera, Linn. Species Plant., (1753), p. 1033: *Lamk.*, Encycl. Meth. III. (1789) p. 232: *R. Brown*, Prodr. Flor. Nov. Holl., (1810), p. 294: *Blume*, Enum. Plant. Jav. I. (1827), p. 23: *Warburg*, in *Engl.* Bot. Jahrb., XIII. (1891), p. 273: *Ceron*, Cat. Plant. Herb. Comis. Flor. Forest., (1892), p. 171: *Usteri*, in Arbeit. aus d. Bot. Mus. Zurich, XIV. (1900), p. 129. *D. sativa*, *Thunb.*, Flor. Jap., (1784), p. 191: *Siebold* in Verhandl. Batavisch Genootsch., XII. (1830), p. 14: *Benth.*, Flor. Hongkong., (1861), p. 368: et Flor. Austral., VI. (18), p. 460: *Hook. f.*, Flor. Brit. Ind., VI. (1892), p. 295: *Drake del Castillo*, Flor. Polynes. Franc., (1893), p. 226: *Ridley*, Mat. Flor. Malay Penins., I. (1907), p. 84.

var. vera.

Insula Mindanao. Ad Todaya in Monte Apo, *Elmer*, 11739.

Section **Enantiophyllum**

Dioscorea luzonensis, Schauer, in Nova Acta Nat. Cur., XIX. suppl. I. (1843), p. 444: *Kunth*, Enum., v. (1850), p. 381: *Ceron*, Cat. Plant. Herb. Comis. Flor. Forest., (1892), p. 171.

Insula Palawan. Ad Puerto Princesa, *Elmer*, 13038.

Dioscorea peperoides.

Tubera ignota. Caules apicem versus inermes (parte basali ignota), glabri, dextrorsum volubiles. Folia subopposita vel alterna, glabra, saepissime late cordata auriculis subrotundatis, abrupte acuminata, ad 12 cm. longa, ad 10 cm. lata, 7-nervia: area media a nervorum lateralium pare primo terminata late oblanceolata: venae secondariae trajectae admodum obliquae et furcatae: petiolus ad 6 cm. longus. Flores masculini ad 60 in spicas 2—4-nas ad axillas foliorum dispositi, iis *D. luzonensis* multo minores: axis ad 6 cm. longus, vix angulatus glaber: bracteae, parvae, lanceolato-ovatae, acuminatae, ex basi repressa ecurvatae, vix 1 mm. longae. Alabastra ex basi triangulari conoidea. Sepala triangulari-ovata, fere acuta, margine hyalina, siccitate rufo-lineolata, 1.5 mm. longa. Petala ovata, acuta, 1.25 mm. longa. Stamina 6: antherae quam filamenta paululo longiores. Flores foeminei in spicas pendentes ad 15 compositi: bracteae ovato-acuminatae, tenuissimae, 1 mm. longae. Sepala ovata, obtusa, margine hyalina, siccitate rufo-lineolata 1.5 mm. longa. Petala paululo minora, similia. Staminodia minuta. Ovarium glabrum, 6 mm. longum. Capsulae despicientes, basi angustata 3 mm. longa inclusa ad 20 mm. longae, supra obtuso truncatae: alae inaequales, 17 mm. longae, 10 mm. latae. Semina loculo conformia, circumcirca alata: ala rufo-castanea.

Insula Luzon. In monte Twin-peaks dicto provinciae Benguet, *Elmer*, 6399 et 6400.

D. peperoides, *Prain & Burkill*, ob foliis et spicis axillaribus valde *D. luzonensi* affinis est, sed flores masculini multo minores sunt. Spicae erectae hae *Piper* et *Peperomiam* suggerunt.

Dioscorea Merrillii.

Tubera ignota. Caules aculeis binis ad bases foliorum armati, vel apices versus inermes, tenues. Folia opposita, longe ovata, supra gradatim angustata, interdum basi subcordata, glabra, subcoriacea, ad 12 cm. longa, ad 5 cm. lata, 7-nervia: area media a pare primo nervorum lateralium terminata late lanceolato-elliptica: venae secondariae oblique trajectae, in rete conspicuiores: petiolus ad 5 cm. longus. Flores masculini ad 50 in spicas dispositi: spicae hae in ramos aphyllos confertae glabros nisi basi ipsa ubi pili perpauci rufi enati sunt; spicarum axes glabri, angulati: bracteae ovato-acuminatae, aliquo modo reflexae, subrufae: bracteolae latiores quam longiores. Alabastra ex basi appressa subglobosa. Sepala ovata, crassa, obtusa, 1 mm. longa. Petala obovata, crassissima, sepalis paululo breviora. Stamina 6: antherae filamenta aequilongae. Flores foeminei ignoti.

Insula Mindanao. Ad Todaya in Monte Apo, *Elmer*, 11924.

Dioscoreae nonnullae Philippinenses, inter quas *D. Merrillii*, ob ramos aphyllos floriferos basi solum pubescentes ab aliis discretae: inter has *D. Merrillii*, *Prain & Burkill*, foliis coriaceis distinguenda. Nomen dedimus in honore cl. *E. D. Merrill*, ducis in re botanica philippinense, qui ipse *Dioscoream* hanc in insula Mindoro, monte Halcon, collexit.

Dioscorea Soror.

Tubera ignota. Caules in partibus superioribus inermes, glabri, dextrorsum volubiles. Folia opposita, sagittata vel cordato-sagittata auriculis rotundatis, apice acuminata, herbacea, ad 16 cm. longa, ad 8 cm. lata per auricularum extremitates, 7-nervia: area media a pare primo nervorum lateralium terminata late oblanceolata: venae secundariae oblique irregulariter trajectae, rete paululo conspicuiores: petiolus ad 7 cm. longus. Flores masculini ad 30 in spicas graciles dispositi: spicae ipsae in ramos aphyllos foliis aequilongos vel paululo longiores compositae: rami pilos perpaucos ad basin conservantes, in partibus aliis glabri; spicarum axes tenues, angulati, ad 6 cm. longi: bracteae anguste ovatae, tenuissimae, repressae, rufo-lineolatae: bracteolae perpusillae. Alabastra ex basi subtriangulare appressa conoidea. Sepala quadratim ovata, obtusiuscula, crassiuscula, rufo-lineolata, 1.5 cm. longa. Petala late oblanceolata, acuta, sepalis paululo breviora. Stamina 6: antherae filamentis aequales. Flores foeminei ad 20 in spicas solitarias pendulas compositi: axis glaber, angulatus, ad 18 cm. longus: bracteae ovatae, acuminatae, tenues, rufo-lineolatae, 1.5 cm. longae. Sepala late ovata, crassa. Petala similia, minora. Staminodia minuta. Capsulae despicientes, basi angustata 4 mm. longa inclusa ad 22 mm. longae, supra aliquo modo retusae: alae latiores quam semicirculares, 21 mm. longae, 20 mm. latae. Semina loculo conformia, circumcirca alata: alae colore fumeae.

Insula Luzon. In monte Mariveles, provinciae Bataan, *Elmer*, 6737.

Dioscorea nummularia, Lamk., Encycl. Meth., III. (1789), p. 231: *Blume,* Enum. Plant. Jav., I. (1827), p. 21, in part. *D. glabra*, *Koorders*, in Mededeel. van s'Lands Plantentuin, XIX. (1898), p. 312.

var. vera. Capsulae non glaucae.

Insula Mindanao. Ad Mambajao insulae Camiguin de Misamis, *Elmer*, 14232.

var. *glauca*. Capsulae maturitate subglaucae.

Insula Luzon. Ad Bauang, in provincia Union, *Elmer*, 5638.

LEAFLETS OF PHILIPPINE BOTANY

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SAPINDACEAE PHILIPPINENSES NOVAE II.*

Auctore

L. Radlkofer
(Royal Botanical Museum, Munich, Germany)

1. Allophylus simplicifolius Radlk.—Vulgo Nanhingon in lingua populi Manobo insulae Mindanao, t. *Elmer*, in sched.

Arbor dense ramosa; rami teretes, stricti, glabri, cortice albescente maculato sparsim lenticelloso; folia 1-foliolata, rudimentis foliolorum lateralium minutissimis subulatis instructa, petiolo longiusculo supra complanato vix sulcato puberulo, novella adpresse albidopilosa; foliolum mediocre, oblongo-lanceolatum, acuminatum, basi acuta petiolulo perbrevi cum petiolo articulato insidens, grossiuscule obtuse subrepando-dentatum, submembranaceum, nervis lateralibus remotiusculis obliquis, subtiliter reticulato-venosum, subtus in axillis nervorum barbatum, ceterum glabrum, praesertim supra saturate viride, utrinque nitidum, epidermide inferiore insigni cellulis permultis majusculis valde mucigeris illas epidermidis superioris aequantibus, interjectis paucis minoribus stomatibus vicinis; thyrsi simplices, tenues, folia subaequantes, longius pedunculati, rhachi basi interrupte, superne conferte cincinnigera puberula; cincinni sessiles, glomeruliformes; flores parvi, glabri, viriduli, petalis albis; fructus — (non suppetebant).

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* Cf. Vol. I. (1907) Artic. 10, p. 208-211.

Arbor 20 ped. alta, trunco 10 pollices crasso, a parte infra medium sita ramos emittente, ligno duro, ramulis gracilibus pendulis, thyrsigeris 2—5 mm. crassis. Folia apice saepius conduplicata et recurvata, petiolo 1.5—2.5 cm. longo adjecto 15—22.5 cm. longa, 5—7.5 cm. lata. Thyrsi 13—20 cm. longi, pedunculo 4.5—7 cm. longo. Alabastra diametro 1 mm. vix superantia.

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 11138, (Distr. Davao, Todaya, Mount Apo, in silvis, m. Jul. 1909, fl.; comm. *Elmer*). No. 13590, (Prov. of Agusan, Cabadbaran, Mount Urdaneta, altit. 1250 ped., m. Aug. 1912, fl.; comm. *Elmer*).

2. Allophylus leptocladus Radlk.—Vulgo Tarangisi in lingua populi Bagobo insulae Mindanao, t. *Elmer*, in sched.

Arbor parva; rami teretes, striati, hirsuti, cortice pallide subfusco lenticelloso; folia 3-foliolata, mediocria, petiolo longiusculo sulcato supra fusco-hirsuto; foliola elliptico-lanceolata, breviter obtuse acuminata, basi acuta, grossiuscule repando-dentata, breviter petiolulata, chartacea, nervis lateralibus remotiusculis obliquis, reti venarum laxo utrinque prominente notata, subglabra, subtus in nervorum venarumque axillis dense barbata, utrinque pallide viridia vel subfusca, nitidula; thyrsi elongati, folia subduplo superantes, ramis duobus ad rhacheos basin enascentibus rhachin ipsam longitudine subaequantibus patulis instructi, subhirsuti, interrupte cincinnigeri; cincinni sessiles, pauci-(2—4)-flori; flores mediocres, sat pedicellati, glabri, albidi; fructus — (non suppetebant).

Rami 2 mm. crassi. Folia petiolo 2.5—3.5 cm. longo adjecto 17—20 cm. longa; foliola cum petiolulis 2—4 mm. longis 14—16 cm. longa, 4—6 cm. lata, lateralia paulo minora. Thyrsi pedunculis 5—7 cm. longis inclusis ad 28 cm. longi. Flores diametro 2 mm.; pedicelli 2 mm. longi. Sepala margine parce glanduloso-pilosa; petalorum unguis et squama albide villosa; discus glabriusculus; stamina fere tota laxe pilosa.

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 11957, (Distr. Davao, Todaya, Mount Apo, in silvis humidis, altit. 4000 ped., m. Oct. 1909; comm. *Elmer*).

3. **Allophylus subinciso-dentatus Radlk.**—Vulgo Basoloy in lingua populi Bagobo insulae Mindanao, t. *Elmer*, in sched.

Arbor parva; rami teretes, glabri, cortice e fusco mox pallescente dense lenticelloso; folia 3-foliolata, mediocria, longiuscule petiolata; foliola elongate oblongo-lanceolata, sensim in acumen acutum mucronulatum angustata, basi acuta, sat petiolulata, duplicatim repando-et subinciso-dentata, dentibus porrectis et subincurvis mucronulatis, chartacea, nervis lateralibus approximatis obliquis, reti venarum prominente notata, utrinque glabra, nitidula, fusca, epidermide inferiore sparsim crystallophora; inflorescentiae paniculiformes, solitariae; folia subaequantes, longe pedunculatae, puberulae, dense cincinnigerae; flores mediocres, glabri; fructus cocci obovoidei, parvuli, glabri.

Arbor 25 ped. alta, trunco 7 poll. crasso, ligno albo; cortice tenui, laevi, griseo, albide maculato. Rami 4 mm. crassi. Folia petiolo 4—6 cm. longo adjecto ad 26 cm. longa, foliola intermedia cum petiolulis ad 6 mm. longis 12—20 cm. longa, 4—5.5 cm. lata, lateralia saepe dimidio minora. Paniculae pedunculo 6—9 cm. longo incluso 16—20 cm. longae. Fructus cocci 7 mm. longi, 5 mm. crassi.

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 11728, (Distr. Davao, Todaya, Mount Apo, south of Baruring river, altit. 3500 ped., m. Sept. 1909, fr.; comm. *Elmer*).

4. **Allophylus repando-dentatus Radlk.**—Vulgo Atig in lingua populi Bagobo insulae Mindanao, t. *Elmer*, in sched.

Arbor parva; rami teretes, glabri, cortice pallescente lenticelloso; folia 3-foliolata, mediocria, longiuscule petiolata; foliola latiuscule oblongo-lanceolata, curvato-acuminata, basi subacuta petiolulis brevibus insidentia, repando-dentata, dentibus obtusiusculis mucronulatis, chartacea, nervis lateralibus sat approximatis, superioribus procurvis, reti venarum utrinque prominente notata, utrinque praeter nervos glabra, nitidula, supra fusca, subtus subfusco-viridia, epidermide inferiore non crystallophora; inflorescentiae paniculiformes, folia dimidia aequantes, sat dense cincinnigerae; flores mediocres; fructus cocci ex obovoideo subglobosi, glabri.

Arbor 18 ped. alta, trunco 6 poll. crasso, ligno albo duriusculo. Rami 3 mm. crassi. Folia petiolo 5—7 cm. longo adjecto ad 20 cm. longa; foliola intermedia petiolulis 5 mm. longis inclusis 13—15 cm. longa, 5—6 cm. lata, lateralia paulo minora. Panicula (una tantum suppetebat) cum pedunculo 5 cm. longo 14 cm. longa. Fructus cocci 6 mm. longi, 5 mm. crassi, aurantiaci (t. *Elmer*).

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 11827, (Distr. Davao, Todaya, Mount Apo, altit. 2750 ped., m. Sept. 1909, fr.; comm. *Elmer*).

5. Lepisanthes ? palawanica Radlk.

Arbor parva; rami teretes, rugoso-striati, glabrati, lenticelloso-punctati, rubro-subfusci, innovationibus gemmis paniculisque pilis brevibus pachydermicis supra basin lateraliter affixis vel plane dibrachiatis flavide tomentellis; folia abrupte pinnata, 1—2-juga, longius petiolata, petiolo teretiusculo striato flavido; foliola magna, elliptico-lanceolata, obtuse subacuminata, in petiolulos conspicuos basi incrassatos supra sulco lato exaratos subtus convexos attenuata, integerrima, membranaceo-coriacea, nervis lateralibus remotiusculis arcuato-adscendentibus nervoque mediano subtus magis quam supra prominentibus flavidis, reti venarum sat arcto utrinque prominulo notata, subopaca, subflavide viridia, glabra, nec nisi glandulis microscopicis raris stipitatis (quorum stipites tantum visi inter epidermidis cellulas immissi) subtus adspersa, diachymatis vix lacunosi cellulis superioribus interiores latitudine aequantibus longitudine subduplo superantibus sat crebre crystalla singula baciliformia gerentibus, epidermide hic illic quoque crystalla similia utrinque fovente non mucigera; paniculae in ramulis defoliatis terminales, pauciramosae, ramis patentibus dichasia sessilia 3-flora gerentibus, pedicellis nullis relictis, bracteis bracteolisque parvis linguiformibus flavide tomentellis; flores non visi; fructus e germine 2-(—3?)-loculari enascens abortu 1-locularis, inaequaliter globosus, loculo abortivo breviore lateraliter annexo gibbosus, supra loculum abortivum in apiculum laterale terminatus, disco annulari hirtello suffultus, firme carnosus (siccus induratus,) indehiscens, glabriusculus nec nisi pilis paucis pachydermicis supra basin ± saccatam lateraliter affixis adspersus, sarcocarpio collenchymatico crassiore in endocarpium tenuius e cellularum linearium varie cruciatarum stratis compluribus et ipsis collenchymaticis conflatum transeunte; semen (loculi evoluti) globosum, testa coriacea subfusca endocarpio arctissime adhaerente (immo cum eo circumcirciter connata?) e cellulis parenchymaticis tanninigeris exstructa fasciculis vasorum percursa; embryo subglobosus, rectiusculus, cotyledones semiglobosae, in directione radiali juxtapositae, exteriore interiorem paullo minorem apice paullulum obtegente, amylo farctae, stomata nulla exhibentes, radicula ad seminis basin perparva, papilliformis; loculi abortivi semen rudimentarium, potius gemmula aucta solitaria, oblonga, lateraliter compressiuscula, tota longitudine angulo centrali affixa, micropyle extrorsum infera.

Rami 3—4 mm. crassi, internodiis 1—10 cm. longis. Folia petiolo 4—6 cm. longo adjecto 20—35 cm. longa; foliola cum petiolulis 1—1.5 cm. longis 15—25 cm. longa, 6—10 cm. lata. Paniculae 18 cm. longae, ramis 5—7 cm. longis. Fructus (aqua emollitus) diametro 2 cm., pericarpio 3—5 mm. crasso. Semen diametro 1 cm.

In Philippinarum insula Palawan: *A. D. E. Elmer*, No. 13046, (Prov. Palawan, Puerto Princesa, Mount Pulgar, m. Apr. 1911, fr.; comm. *Elmer*).

6. Tristiropsis ovata Radlk.—Vulgo Brayo in lingua populi Bagobo insulae Mindanao, t. *Elmer*, in sched.

Arbor mediocris, gracilis, apice breviter ramosus, coma densa, cortice laevi griseo albo-maculato (*Elmer*), innovationibus fulvo-tomentellis; foliorum bipinnatorum pinnarumque rhachis teretiuscula, striata, canescenti-pulverulento-puberula; foliola (singularum pinnarum) 6—9, alterna, ovata (duplo longiora quam lata), obtusa, basi inferiora rotundata vix inaequilatera, superiora subacuta, breviter petiolulata, subchartacea, margine planiuscula vel ± undulata, supra sordide viridia, subtus pallidiora, utrinque nitidula; panicula (fructifera tantum visa) quam folia dimidio minor, pauciramosa, ramis oblique erectis, pulverulento-puberula; fructus parvus, obovoideus, prominenter 3 angulatus, in stipitem perbrevem contractus, minutim apiculatus, adpresse chryseo-tomentellus.

Arbor 45 ped. alta, trunco 1 ped. crasso. Rami 4 mm. crassi. Folia petiolo 4—6.5 mm. longo adjecto ad 25 cm. longa, pinnae ca. 15 cm. longae; foliola cum petiolulis 2—3 mm. longis 5—8 cm. longa, 2—3.5 cm. lata. Panicula 12 cm. longa, rhachi 2 mm. crassa, ramis 4 cm. longis; pedicelli (fructigeri) 6—8 mm. longi. Fructus 1.8 cm. longus, 1.4 cm. crassus.

In Philippinarum insula Mindanao; *A. D. E. Elmer*, No. 11909, (Distr. Davao, Todaya, Mount Apo, m. Oct. 1909, fr.; comm. *Elmer*).

7. **Euphoria gracilis Radlk.**—Vulgo Sanganan in lingua populi Manobo insulae Mindanao, t. *Elmer*, in sched.

Arbor minus alta, erecta, sat gracilis; rami teretes, apice ut et inflorescentiae pube brevi fasciculato-stellata sordide flavida adspersi, dein glabrati, cortice cinerascente; folia 3-juga; foliola subopposita, anguste lanceolata, acuminata, margine undulata, in petiolulos longiusculos attenuata, chartacea, nervo mediano supra impresso subtus nervisque lateralibus utrinque 10—12 oblique erectis prominentibus, obsolete reticulato-venosa, supra glabra, laevia, nitida, pallide viridia, subtus pilis fasciculato-stellatis raris aliisque brevibus subulatis rectangule patentibus aegre perspiciendis adspersa, papillosa, papillis altioribus inter se (supra stomata conniventibus exceptis) distantibus, cinerascenti-opaca; paniculae terminales axillaresque fasciculatim congestae, foliis breviores, ramis thyrsoideis laxiuscule cymulas subsessiles gerentibus; calycis segmenta angustiora, ovato-lanceolata, extus pilis fasciculato-stellatis tomentella, intus pilis subsimplicibus pubescentia; petala e spatulato anguste lanceolata, calycem superantia, apice recurvata, extus infra medium intus praeter unguem tota adpresse villosa; discus hirsutus; stamina superne pilosa; germen (fl. fem.) 2-loculare, 2-coccum, hirsutum, stylo inter loculos elongato, stellato-piloso, apice 2-lobo; fructus—(non suppetebat).

Arbor 25 ped. alta, trunco 5 poll. crasso. Rami 3 mm. crassi. Folia petiolo ca. 4 cm. longo adjecto 16—22 cm. longa; foliola superiora 10—14 cm. longa, 2.5—3.2 cm. lata, reliqua minora. Paniculae ca. 12 cm. longae, 8 cm. latae.

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 13482, (Prov. of Agusan, Cabadbaran, Mount Urdaneta, altit. 4000 ped., m. Aug. 1912, fl.; comm. *Elmer*).

8. Nephelium robustum Radlk.

Arbor mediocris; rami teretiusculi, sulcati, glabrati; folia 8—9-juga; foliola robusta elongate oblonga, utrinque subacuta, petiolulis robustis transversim rugosis suffulta, coriaceo-chartacea, multinervia, nervis lateralibus sat approximatis utrinque ca. 25 oblique patulis subtus prominentibus, clathrato-venosa, venulis ultimis reticulatis, supra glabra, fusco-viridia, nitidula, subtus juxta nervos pilis tenuibus adspersa, ceterum glabrata, e viridi glaucescenti-opaca, cellulis secretoriis destituta, epidermide non mucigera; paniculae robustae, terminales, iterum et iterum ramosae, ramulis triangularibus crassiusculis strictis oblique erectis dense glomeruligeris rhachique sulcatis pube brevi crispula cinnamomea indutis; flores apetali, breviter pedicellati; calyx coriaceus; discus hirsutus; fructus juveniles (nondum semimaturi) plerumque monococci, cocci breviter ellipsoidei, densissime squarrose muricati, processibus filiformibus rectiusculis vel superioribus apice incurvatis inferne glabratis superne sufferrugineo-hirtis; semen juvenile oblongum, micropyle apicali.

Arbor 35 ped. alta, trunco 1 ped. crasso. Rami paniculigeri 1 cm. crassi. Folia petiolo 10 cm. longo 6 mm. crasso adjecto 70 cm.—1 m. longa, rhachi apice 2—3 mm. crassa, interjugis 3—6.5 cm. longis; foliola cum petiolulis 1 cm. longis 2—3 mm. crassis 20—28 cm. longa, 6—7 cm. lata, infima plus dimidio minora. Panicula 28 cm. longa, 15 cm. lata, rhachi subtrigona basi 7 mm. crassa, bracteae parvae, deltoideae, tomentellae. Calyx 5-partitus, partibus deltoideis, extus puberulus; intus adpresse pubescens. Stamina (fl. fem.) brevia, filiformia, tomentosa; antherae villosiusculae. Germen dicoccum, verruculosum, sufferrugineo hirtum, stylo brevi apice bicruri, cruribus recurvatis. Fructus maturus non suppetebat.

In Philippinarum insula Palawan: *A. D. E. Elmer*, No. 12934, (Prov. Palawan, Puerto Princesa, Mount Pulgar, m. Apr. 1911, fl. et fr. juv.; comm. *Elmer*).

9. Nephelium xerospermoides Radlk.—Vulgo Loo-ou in lingua populi Bagobo insulae Mindanao, t. *Elmer,* in sched.

Arbor parva, erecta; rami teretes, rugoso-striati, glabri, colore cinnamomeo (ut in *N. melanomisco*) a petiolis nigricantibus distincti; folia 2—3-juga; foliola subopposita, mediocria, lanceolata, sat petiolulata, coriacea, nervis lateralibus sat approximatis oblique procurvis subtus prominulis, subtiliter reticulato-venosa, supra glabra, e viridi subfusca, nitida, subtus juniora pilis brevibus adpressis adspersa, dein glabrata pallidiora glaucescenti-opaca, in nervorum axillis obsolete foveolata, cellulis secretoriis nunc destituta (*Elmer,* No. 11205), nunc instructa (*Klemme,* No. 15215), epidermide partim mucigera; paniculae axillares et terminales, folia subaequantes, pauciramosae; flores — (non suppetebant); fructus cocci (solitarii) obovoideo-ellipsoidei, tuberculati, tuberculis basalibus praesertim supra in cristas parallelas secus medianam ad tertiam cocci partem extensis et partim connexis, subtus minus extensis, apicalibus conos apice tomentellos sat approximatos exhibentibus; semen ellipsoideum, a lateribus compressiusculum, hilo oblongo, micropyle prope apicem ventrali; cotyledones ± inaequales, oblique superpositae, crassae, (siccae) brunneae, induratae, amylo tanninoque foetae; radicula prope seminis apicem ventralis, sursum versa.

Truncus arboris 30 ped. altus, 8 poll. crassus, a medio ramis obsitus, cortice griseo maculato. Rami ultimi fasciculati, ca. 5 mm. crassi. Folia petiolo 2—2.5 cm. longo adjecto ad 20 cm. longa; foliola cum petiolulis 5 mm. longis 7—12 cm. longa, 2—4.5 cm. lata. Paniculae 8—16 cm. longae; pedicelli fructigeri apice incrassati 1 cm. longi. Fructus cocci 3—4 cm. longi, 2 cm. crassi, rubescentes (edules).

In Philippinarum insula Mindanao: *A. D. E. Elmer,* No. 11205, (Distr. Davao, in silvis secus flumen Sibulan, alt. 1250 ped., m. Jul. 1909, fruct.; comm. *Elmer*). *W. Klemme,* No. 15215, (Distr. Zamboanga, Port Banga, m. Jul.—Sept. 1910, fr.; comm. ex Hb. Manila).

10. Guioa salicifolia Radlk.

Rami teretes, subfusci, glabri, novelli puberuli; folia pari-pinnata; foliola (4—) 6, opposita, minora, anguste lanceolata, apice in acumen obtusum, basi in petiolulos breves sensim attenuata, integerrima, margine subrevoluta, membranaceo-coriacea, supra fusca et praeter nervos pulverulento-puberulos glabra, subtus pilis adpressis laxe adspersa et dense breviter tuberculato-papillosa, inde glaucescenti-opaca, 1-foveolata, minutim pellucido-punctata; rhachis foliorum superne anguste marginata; inflorescentiae axillares, folia dimidia aequantes, puberulae, ramis thyrsoideis cincinnos stipitatos saepius elongatos 6—7-floros gerentibus; flores inter minores, breviter pedicellati; sepala basi puberula, margine ciliolata; petala elliptica, squamulis villosis (praeter anterius) aucta; discus interruptus, glaber; stamina fere tota villosiuscula. Flores fem. fructusque non suppetebant.

Rami 5 mm. crassi. Folia petiolo 2—3 cm. longo adjecto 12—14 cm. longa; foliola 5—7 cm. longa, 1.2—1.8 cm. lata. Inflorescentiae 5—8 cm. longae; pedicelli 1.5 mm. longi. Flores expansi diametro 3 mm.

In Philippinarum insula Sibuyan: *A. D. E. Elmer*, No. 12286, (Prov. Capiz, Magallanes, Mount Giting-Giting, m. Apr. 1910, fl.; comm. *Elmer*).

11. Guioa lasiothyrsa Radlk. in *J. Perkins* Fragm. Fl. Philipp. Fasc. I (1904) p. 63.

Forma **Elmeri Radlk.** (forma nova).

Frutex laxe et tenuiter ramosus, 4 m. altus, foliis ad 6-jugis, foliolis minoribus, 1.5—4.5 cm. longis, 0.8—1.4 cm. latis, superioribus leviter sigmoideo-curvatis.

In Philippinarum insula Luzon: *A. D. E. Elmer*, No. 9315 et 9342, (Prov. Tayabas, Lucban, m. Maj. 1907, fl,; comm. *Elmer*).

12. Guioa discolor Radlk.

Rami teretes, leviter striati, nigro-fusci, apice tenuiter puberuli; folia pari-pinnata; foliola 6—8, subopposita, inaequilatere elongate lanceolata, subfalcata, sensim acute acuminata, in petiolulos longiusculos, basi incrassatos attenuata, integerrima, subrevoluta, subcoriacea, nervis lateralibus utrinque 8—9 procurvis subtus prominulis, supra fusca, opaca, glabra, subtus canescenti-papillosa (papillis elongatis digitiformibus apice vix in coronulam dilatatis) et pilis minutis adpressis laxe adspersa, basi ad latus exterius angustius 1-foveolata, impunctata; rhachis foliorum nuda; paniculae in foliorum axillis saepius binae ternae congestae, quam folia dimidio breviores, a basi ramosae, ramis puberulis cymulas stipitatas paucifloras gerentibus; flores pedicellati, bracteolis subulatis suffulti; sepala glabra, praesertim interiora majora ciliolata; petala (4) squamulis 2 cristatis villosis aucta; discus semilunaris, glaber; stamina villosiuscula; pistillum auctum (fructus juvenilis) obcordato-3-lobum, breviter stipitatum, ad angulos pilis singulis adspersum, stylo subulato curvato 3—sulcato coronatum.

Arbor 15-metralis, cortice griseo. Rami 3—4 cm. crassi. Folia petiolo 4—5 cm. longo adjecto 20—24 cm. longa; foliola cum petiolulis 6—8 mm. longis 12—13 cm. longa, 2.5—3.5 cm. lata, superiora fere dimidio minora. Paniculae 10 cm. longi et lati, sepalis rubicundis, petalis albidis.

In Philippinarum insula Luzon: *A. D. E. Elmer*, No. 7493 et 9321, (Prov. Tayabas, Lucban, m. Maj. 1907, fl.; comm. *Elmer*).

13. Guioa myriadenia Radlk. in sched. plant. Philippin. ab *Aug. Loher* collectar., No. 2063, (a. 1897).

Rami teretes, striati, juniores ut et petioli thyrsique sufferrugineo-tomentosi, adultiores glabrati, cortice subfusco; folia abrupte pinnata; foliola 5—8, alterna vel subopposita, subaequilatera, ex ovali vel ovato oblonga, brevius acuminata, basi obtusa vel subacuta petiolulis basi incrassatis insidentia, integerrima, subrevoluta, subcoriacea, nervis lateralibus approximatis (utrinque 10—13) basi patulis ante marginem procurvis subtus prominentibus, supra subfusca, praeter nervum medianum glabra, subtus papillis latiusculis subcontiguis canescenti-glauca et pilis sufferrugineis juniora molliter, adultiora laxius pubescentia nec non glandulis microscopicis rubrofuscis clavatis pluricellularibus stipite brevi articulato sublaterali suffultis innumeris praesertim ad nervos et venas adspersa, efoveolata, cellulis secretoriis staurenchymatis elongatis cylindricis vel ± lageniformibus pneumatenchymatis globosis (ut et sepala) instructa; rhachis foliorum nuda; paniculae axillares vel subterminales, folia dimidia aequantes, ramis crebris thyrsoideis cymulas sessiles confertas gerentibus; flores majores, rubescentes; sepala rotundata, flavescenti-puberula, glanduloso-ciliolata, petala (4 completa, quintum rudimentarium esquamatum) spathulata, intus supra unguem villosum squamulis 2 linearibus cristatis villosis lamina paullo brevioribus aucta; discus semilunaris, glaber; stamina fere tota villosula; pistilli rudimentum obovato-trigonum, sericeo-tomentosum.

Arbor ? Rami 4 mm. crassi. Folia petiolo 2—3 cm. longo adjecto 15—20 cm. longa; foliola cum petiolulis 5 mm. longis 9—13 cm. longa, 3—4.5 cm. lata. Flores 3—4 mm. longi et lati; petala 3 mm. longa.

In Philippinarum insula Luzon: *Loher* No. 2063, (Prov. Benguet, Rocas de Trinidad, fl.; Hb. Kew., Monac.); *Elmer* No. 8704, (in ead. prov., Baguio, m. Mart. 1907, fl.); *Merrill* Hb. Philip. No. 723, (leg. *Merrill,* in ead. prov., m. Maj. 1911, fr. juv.)

14. Guioa truncata Radlk.—Vulgo Caricir-ta-babana in lingua populi Bagobo insula Mindanao, t. *Elmer,* in sched.

Rami teretes, ruguloso-striati, glabri, fusci; folia abrupte (interdum pari-) pinnata; foliola circ. 6, ovali-lanceolata, acuminata, in petiolulos latiusculos basi tumidos attenuata, integerrima, subcoriacea, obliquinervia, glabra, supra fusca, subtus viridia, epapillosa, plurifoveolata, cellulis secretoriis crebris praesertim per staurenchyma persita, inde dense pellucide punctata; rhachis foliorum marginata; paniculae axillares, ramosae, folia superantes, glabriusculae; sepala (sub fructu relicta) fere petaloidea, late ovata, breviter ciliolata; discus semilunaris glaber; capsula truncato-obcordata, 3-alato-lobata, in stipitem manifestum triquetrum attenuata, margine loborum acuto, glabra, fusco-viridis (t. *Elmer*), sicca rubro-fusca quodammodo pruinosa, endocarpio laevi, subtilissime horizontaliter striato; semina (juvenilia) lenticularia; arillus basi processu descendente caudatus, ceterum nondum sat evolutus.

Arbor, trunco 20 ped. alto, 6 poll. crasso, dense ramosa (t. *Elmer*). Rami 5 mm. crassi. Folia petiolo 3 cm.

longo adjecto ad 15 cm. longa; foliola ad 7 cm. longa, 2 cm. lata, inferiora minora. Paniculae ad 16 cm. longae. Capsula 1 cm. alta, 1.3—1.5 cm. lata.

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 11219, (Distr. Davao, Todaya, Mount Apo, m. Jul. 1909, fr.; comm. *Elmer*).

15. Cupaniopsis patentivalvis Raldk.

Arbor mediocris, cortice laevi brunneo; rami teretes, internodiis brevibus, ad cicatrices foliorum quodammodo nodosi, subflexuosi, cortice fusco, juveniles, ut et foliorum rhachis, ochraceo-tomentelli, denique ± glabrati; folia ad apices ramorum conferta, abrupte pinnata, 7—10-juga, petiolo breviusculo semitereti; foliola mediocria, opposita vel interdum alterna, oblonga, subacuta, in petiolulos basi dilatatos attenuata, crenato-dentata, subcoriacea, nervis lateralibus utrinque 7—9 sat aproximatis procurvis in sinus inter dentes excurrentibus subtus prominentibus, juvenilia praesertim ad nervos supra subtusque flavescenti-pubescentia glandulisque microscopicis clavatis stipitatis adspersa, rubicunda, adultiora glabrata, opaca, (sicca) supra atro, subtus rubro-fusca, diachymate cellulis secretoriis quodammodo pachydermicis gummi-resinam quandam (in aqua et in alcohol solubilem sed cellulam integram—etiam post aquae Javelli applicationem—non transgredientem et solutione Jodi aquosa colore flavo tinctam) foventibus praesertim ad paginam inferiorem persito una cum epidermide non mucigera valde tanninigero; thyrsi folia subaequantes, e ramis crassioribus (si recte conjicio) enascentes, sordide minutim puberuli; flores — non visi, nisi partes sub fructu relictae sepala 5, oblonga, obtusa, imbricata, decidua; petalorum cicatrices 5; discus minutim patellaris, glaber, margine libero sublobato; stamina intra discum inserta — ; capsula 3-locularis, subdrupacea, minor, pyriformis, acute 3-angularis, angulis loculorum dorso respondentibus, apiculata (apiculo striis stigmatosis 3 saturalibus declivis sulco levi exaratis basi extenuatis notato), in stipitem breviusculum attenuata, loculicide 3-valvis, valvis septigeris denique horizontaliter patentibus planiusculis utrinque glabris, sarcocarpio rubro-fusco sat crasso cellulis secretoriis paucis persito, endocarpio sclerenchymatico juxta septa angusta crassiuscula basique incrassato; semina erecta, ellipsoidea, subtrigona, leviter incurva, fusco-brunnea, arillo tenui (cellulas resinigeras nullas fovente) dorso ad medium, ventre ad apicem usque obtecta; embryo oleoso-carnosus, amylo perpauco instructus.

Arbor 10 m. alta. Rami 6 mm. crassi. Folia petiolo 3 cm. longo adjecto 20—24 cm. longa; foliola cum petiolulis 5 mm. longis 7—8.5 cm. longa, 2 cm. lata. Pedicelli fructigeri 5 mm. longi. Fructus cum stipite 2—3 mm. longo 12 mm. longi, 7 mm. lati. Semina 5 mm. longa, 2 mm. crassa.

In Philippinarum insula Luzon: *A. D. E. Elmer*, No. 9319, (Prov. Tayabas, Lucban, m. Maj. 1907, fr.; comm. *Elmer*).

16. Dictyoneura philippinensis Radlk.—Vulgo Nosip in lingua populi Bagobo insulae Mindanao, t. *Elmer*, in sched.

Arbor; rami teretiusculi, striati, rubro-fusci, minutim fulvo-puberuli, mox glabrati; folia abrupte pinnata, petiolo tereti rhachique supra planiuscula subtiliter striatis minutim puberulis denique glabrescentibus; foliola 8—10, alterna, oblongo-vel (inferiora) ovato-lanceolata, acuminata, subintegerrima vel hic illic dentata, basi inaequilatera (latere interiore latiore) in petiolulos breves basi tumidulos contracta, membranacea, utrinque subtiliter reticulato-venosa, sparsim pellucido-punctulata, glandulis lepidoideis adspersa, ceterum glabra; thyrsi axillares, simplices vel saepius ramis divaricatis paucis adjectis in paniculas transeuntes, minutim laxe puberuli; flores breviter pedicellati; sepala praeter marginem ciliatum subglabra; filiamenta subulata; germen ovatum, pilosum; capsula major obovoidea, in stipitem brevem contracta, coccinea, extus glabrata granulata, intus sat dense pilosa, loculicide bivalvis, abortu 1-sperma; semen ovoideum, nigro-fuscum, nitidum, ventre usque ad medium vel ultra arillo obductum.

Arbor erecta, 30 ped. alta (*Elmer*). Rami 3—4 mm. crassi. Folia petiolo 3—5 cm. longo adjecto 20—30 cm. longa, foliola cum petiolulis 3—5 mm. longis 5—16 cm. longa, 2—5 cm. lata. Inflorescentiae 12—20 cm. longae; pedicelli 2—4 mm longi. Alabastra globosa, diametro ca. 2.5 mm. Capsula 1.5 cm. longa, 1.2 cm. crassa. Semen 1 cm. longum, 6 mm. crassum.

In Philippinarum insula Mindanao: *Mary Strong Clemens* sub lit. "W" (Camp Keithley, Lake Lanao, altit. 800 m., m. Mart. 1907, fl.), No. 532 et 567 (ibid., m. Maj. 1906, fr., comm. ex Hb. Manila); *A. D. E. Elmer* No. 10965, (Distr. Davao, Todaya, Mount Apo, in fertile soil of a dry forested ridge at 1750 feet above the Baracatan creek, m. Jun. 1909, fr.; comm. *Elmer*).

17. **Trigonachras brachycarpa Radlk.**—Vulgo Tapotasa in lingua populi Bagobo insulae Mindanao, t. *Elmer*, in sched.

Arbor alta; rami thyrsique ferrugineo-tomentelli; folia magna, elongata, abrupte pinnata, petiolo longo teretiusculo striato basi puberulo; foliola ca. 16, inferiora subopposita, superiora alterna, ovato-vel oblongo-lanceolata, subaequilatera, acuta, basi oblique obtusata, sat petiolulata, submembranacea, nervis lateralibus procurvis utrinque prominulis, glabra, supra nitida, subtus opaca et in axillis nervorum glandulis maculiformibus notata, fusco-viridia, crebre pellucido-punctata, epidermide mucigera; inflorescentia axillaris, folia subaequans, a basi ramificata, ramis thyrsoideis et ipsis ramuligeris, superne sat dense cincinnigeris, cincinnis vix stipitatis; flores generis sat pedicellati, calycis segmentis ovatis subacutis utrinque sufferugineo-tomentosis, petalis obovatis unguiculatis albis pellucido-punctatis intus squamulis 2 cristatis densissime villosis auctis, staminibus exsertis inferne germineque (fl. masc.) rudimentario villosis; capsula minor, trigono-pyriformis, infra partem seminiferam subglobosam in stipitem contracta, apiculata, obtusangula, attamen angulis (loculorum dorso respondentibus) carina prominula filiformí obducta, rugulosa, ferrugineo-tomentella, exocarpio carnoso (t. *Elmer*,) succo viridulo viscoso (i. e. more generis saponino) foeto, endocarpio sclerenchymatico ochraceo-tomentoso; semina (immatura tantum visa) oblonga, laevia, exarillata.

Arbor 16 m. lata, trunco 1 m. crasso tereti tortuoso supra medium ramificato, cortice laevi cinereo albo-maculato. Rami inflorescentias gerentes 1 cm. crassi. Folia petiolo 15 cm. longo adjecto 70 cm. longa; foliola cum petiolulis 5 mm. longis 14–15 cm. longa, 5—6 cm. lata. Capsula (submatura) 2 cm. longa, 1.5 cm. lata.

In Philippinarum insula Mindanao: *A. D. E. Elmer*, No. 10949, (Distr. Davao, Todaya, Mount Apo, on wooded ridges along the Baracatan creek, altit. 500 m., m. Jun. 1909, fr.; comm. *Elmer*).

18. Mischocarpus endotrichus Radlk.

Arbor sat magna; rami teretes, glabri, subfusci, cortice corrugato-striato: folia abrupte pinnata, petiolo supra complanato subtus convexo striato glabro, rhachi superne 2-sulcata; foliola 7—8, alterna, elliptico-lanceolata, breviter acuminata, basi acuta petiolulis sat longis insidentia, integerrima, quodammodo conduplicata et subfalcatim recurvata, coriacea, nervis lateralibus tenuibus procurvis subtus prominulis, glabra, supra laeviuscula nitida e viridi fuscescentia, subtus reti venarum laxiore parum conspicuo notata opaca pallide viridia, foveolis nullis, glandulis basi immersis raris supra obsita, impunctata, attamen cellulis secretoriis subglobosis persita aliisque utriculiformibus seriatis praesertim prope paginam inferiorem instructa, epidermide inferiore parsim crystallophora; thyrsi (fructigeri tantum visi) folia vix aequantes ad ramorum apices circa innovationes terminales axillaresque 2—4 congesti, foliis novellis rudimentariis bracteiformibus suffulti, ramulo uno alterove aucti, glabri, vix apice minutim puberuli, cincinnos breviter stipitatos sat elongatos apice fructigeros gerentes, cincinnis plurimis (sterilibus) decisis cicatrices scutelliformes (similes cicatricibus largioribus in ramorum parte inferiore defoliata a thyrsis anni praeteriti delapsis ipsis relictis) relinquentibus; flores sat pedicellati; sepala deltoidea, minutim puberula; petala minuta, lanceolata, esquamulata, basii ntus puberula; discus tumidulus, glaber; capsula trigono-clavata, in stipitem attenuata, apice truncata, apiculata, loculis dorso obtuse carinatis glabris intus pilis subsetaceis 1-cellularibus pubem densam molliusculam efficientibus vestitis, endocarpio toto sclerenchymatico, semen (submaturum) obovoideum; arillus dorso depressus calcaratus.

Rami 5—6 mm. crassi. Folia petiolo ca. 4 cm. longo adjecto ad 20 cm. longa; foliola cum petiolulis 1 cm. longis 6.5—11 cm. longa, 3—4 cm. lata. Thyrsi ad 16 cm. longi; pedicelli (fructigeri) 4 mm. longi. Capsula cum stipite 6—7 mm. longo 1.5 cm. longa, 8 mm. crassa.

In Philippinarum insula Palawan: *A. D. E. Elmer*, No. 12977, (Prov. Palawan, Puerto Princesa, Mount Pulgar, altit. 2000 ped., m. Apr. 1911, fr.; comm. *Elmer*).

Observatio.

Praeter species supra et in Vol. I (1907) p. 208—211 editas a *Dom. A. D. E. Elmer* in Philippinis primum collectae fuerunt:

Nephelium lappaceum Linn., coll. No. 12866, 13062, 13069, in Ins. Palawan, Puerto Princesa, Mount Pulgar, m. Apr. 1911, alab.

Nephelium chryseum Bl., coll. No. 12882, ibid., m. Mart. 1911, fr. semimat.

Guioa pubescens Radlk. (*Sapindus pubescens Zoll.* et *Mor.*), coll. No. 13103, ibid., m. Apr. 1911, fr.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. V. Manila, P. I., May 28, 1913. Art. 80.

TWO NEW SPECIES OF RUBUS

by

A. D. E. Elmer

and

W. O. Focke

(Bremen, Germany)

Rubus philippinensis Focke n. sp. Subg. *Malachobatus:* Sect. *Acuminati;* conf. *Focke,* Spec. Rubor. I, p. 49.

Praesto est ramus fertilis unicus. Ramus praeter inflorescentiam terminalem simplex, teres, laxe villosus aculeis parvis e basi lata recurvis instructus. Folia breviter (0.5—1.0 cm.) petiolata, oblonga vel oblongo-lanceolata, fundum versus angustata, apice longius vel brevius acuminata, ad 10 cm. longa, 4 cm. lata, inferne remote, antice crebrius serrata, utrinque fere 8-costulata, costulis arcuato-ascendentibus praeter nervos subtus sparsim pilosos glabriuscula. Stipulae......caducae.

Inflorescentia terminalis subcorymboso-paniculata (fere 10 cm. longa, 12 cm. lata); rami 4 inferiores axillares, foliis fere aequilongi, patentes, paniculato-multiflori; terminales extra-axillares, breviores, approximati. Bracteae parvae, in lacinulas paucas lineares fissae. Pedunculi cum calyce canescenti-tomentelli, inermes. Sepala triangulari-lanceolata, ca. 5 mm. longa, integra, in flore per breve tempus reflexa, deinde incurvo-ascendentia; petala? Stamina numerosa,

filamentis tenuibus longis. Carpella pauca majuscula, cum stylorum longorum parte inferiore laxe pilosa, matura segregatim seacedentia, carpophorum denso pilorum annulo circumdatum. Drupeolae exsiccatae lutescenti-albidae, ca. 4 mm. longae, 2.0—2.5 mm. latae, ut videtur parum carnosae.

Mindanao: Cabadbaran (Mt. Urdaneta), Prov. Agusan, *A. D. E. Elmer*, No. 13606.

This plant resembles *R. acuminatus* and its allies in the short petioles, the shape of leaves and bracts, the size and number of carpels, etc., but it is differs by the long patent inferior branches of the subcorymbose panicle and by long filiform filaments. The whitish colour of the dried drupelets is very curious.

Rubus apoensis Elmer n. sp.

Usually solitary, erect, sometimes branched from near the base, 2 to 5 dm. high; stem green, distinctly woody towardy the base, terete, yellowish brown pulverulent, less than 4 mm. thick toward the base, only springly branched from above the middle. Roots numerous and wiry Leaves alternate, divaricately spreading, the basal ones scarcely longer than 5 cm., the upper or larger ones three times as long, with 5 to 7 leaflets, imparipinnate; rachis dirty yellowish pulverulent; with scattered straw brown slightly recurved spines, the petiole proper about 3 cm. long; stipule of one to several linear segments or with few laciniate divisions, 7.5 mm. long or less; leaflets flat, soft, a trifle paler green beneath, drying brown, the terminal one largest, ovately elongated, the lamina 1 dm. long by 4.5 cm. wide below the middle, subsessile, the terminal one, finely pulverulent along the veins on both sides, slenderly acuminate at apex, base subcuneate or truncately rounded, the lower leaflets smallest, ovate to elliptic or even obovate; margins doubly dentate, the serratures finely apiculate, subentire around the base; nerves about 10 pairs in the terminal or largest leaflet, 5 to 7-nerved in the others, oblique, brown, also visible from the upper side. Inflorescence axillary, 3 cm. long, in fruit 5 cm. long, only few branched from the middle, ascending, the stalks puberulent not glandular; pedicel slender, similar in vestiture, curvingly spreading, subtended by linear bracts; calyx green, at least 1.75 cm. across, rotately spreading, 5-segmented, coriaceous, puberulent or when young brown pubescent; segments oblong, acuminate, united around the basal one third, tips caudate, longitudinally veined; petals as many and alternating with the calyx segments, obovately rotund or rotund and with subcuneate base, 7.5 mm. long by 5 mm. wide above the middle, creamy white, glabrous-inserted upon the united calyx portion, also veined longi, tudinally, entire, free; stamens many, inserted upon the coriaceous united calyx portion; filaments slightly unequal in length, averaging 2 mm. in length, subterete, glabrate, strongly curved at the constricted apex; anther broadly oval, roundly bilobed at base, emarginate at apex, dorsificed, at least 0.5 mm. long; ovary 1 mm. long, irregularly compressed, obliquely truncate and pulverulent at apex, terminated by a 1.5 mm. long terete style which toward the stigmatic portion becomes dark brown. Berry 1 cm. long, somewhat elongated, shining light red; achene 1.5 mm. long, nearly 1 mm. thick, slightly compressed, with a subterminal subpersistent style, very coarsely pitted, more tapering toward the base;

Type specimen number 10464, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Scattering patches moist fertile humus covered soil of forests at 4000 feet altitude. The Bagobos call it "Sapmittatana."

This number *Dr. Focke*, announces as intermediate between *R. tagallus C.* et *S.* and *R. rosaefolius Sm.* It certainly is distinct from either, especially from the latter under which name it was distributed.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. V. Manila, P. I., May 30, 1913. Art. 81.

PHILIPPINE PYGEUM

by

A. D. E. Elmer

Pygeum coccineum Elm. n. comb. *Parinarium coccineum Elm.* Leaf. Philip. Bot. II; 578, 1909.

So far only known from my original collection made in southern Negros.

Pygeum clementis Merr.

A large fruited and relatively large leaved species from the lake Lanao region of central Mindanao.

Pygeum glandulosum Merr.

Rather common, but especially so in the north middle portion of our archipelago.

Pygeum megaphyllum Merr. ms.

Collected only once at San Antonio, province of Laguna, Luzon. Foliage very similar to *P. latiphyllum Elm.*

Pygeum preslii Merr.

Based upon *Cuming* 1815 with rather broad leaves. A specimen from northern Mindanao, Bureau of Science number 15724 is a very close match.

Pygeum reticulatum Merr.

Herbarium name only, based upon three specimens collected by *S. García* at Baler, province of Principe, Luzon. Apparently very similar to *P. glandulosa Merr.*

Pygeum fragrans Elm.

To me it does not seem referable to typical *P. preslii Merr.*, though most of the material under said covers may be referable to our name.

Pygeum latiphyllum Elm. n. sp.

Slender tree; trunk 10 m. high, 2 dm. thick, slender; wood moderately soft, white, burly, odorless, tasteless; bark rather thin, smooth, mottled with gray and brown; twigs brown puberulent, ultimately glabrous, more or less lenticelled, subterete, mainly at the top, horizontally spreading, comparatively short but freely rebranched. Leaves without basal glands, horizontal or slightly rebranched, thinly coriaceous, glabrous, conduplicate on the upper dull green surface, much lighter green beneath, ovate or ovately elongated, the average lamina 2 dm. long, 12 cm. wide below the middle, the upper portion gradually tapering to the acute to acuminate apex, base broadly rounded, entire, turning brown while drying, alternatingly scattered along the branchlets; midvein very stout and glabrous on both sides, the 6 to 8 ascending lateral nerves obscurely anastomosing at their ends, reticulations also obscure on both sides; petiole 1.5 cm. long, thick, ultimately glabrous, caniculate above, somewhat wrinkled in the dry state; bud bract broad, ovately oblong, 7 mm. long, hairy on the exterior, truncate at apex, base expanded. Bud inflorescence compressed, densely and imbricately bracteate, yellowish brown tomentose; old inflorescence or very young infrutescence spicate, usually solitary from the leaf axils or more numerously clustered along leafless branchlets, 5 to 8 cm. long or longer, fulvus puberulent or pubescent in anthesis, flower bearing from near the base, the basal portion thickened and subtended by deciduous imbricated distinctly notched bracts which are silky pubescent on the outer side only, ovately oblong and from 3 to 8 mm. long; pedicels ascending, slender, 7.5 mm. long, similarly puberulent, alternatingly scattered, terminated at the apex by the persistent perianth rim; young fruits glabrous, ovoidly ellipsoid, short pointed.

Type specimen number 11828, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Gathered from sparsely wooded nearly precipitous bluffs along the Bururing river at 2750 feet altitude. "Balla" is the Bagobo name.

Pygeum apoense Elm. n. sp.

Large trees with spreading limbs; trunk 15 dm. thick, 25 m. high; main branches from the middle and widely spreading, rebranched; bark mottled, smooth or lenticelled on the stem, quite thick, reddish brown beneath the epidermis; wood moderately hard, whitish on the outside, reddish toward the center, without odor or taste; twigs thick, short fulvus pubescent, the older portions nearly glabrous, lenticelled and with scar connections. Leaves rigidly coriaceous, spreading horizontally, shining deep green and glabrous on the upper conduplicate side, much lighter green beneath, drying brown, entire, oblong to elliptic, the average blades 15 cm. long by 6 cm. wide, apex rounded or obtuse, base similar although the lower one half is usually more tapering than the apical portion, alternatingly scattered, beneath finely puberulent, eglandular at base; midvein stout beneath, fulvus pubescent even so in the groove along the upper side, the 10 lateral yellowish nerves oblique, less prominent but similar in pubescence; bud bracts triangularly ovate, 5 mm. long or less, hairy on the back only; petiole 5 to 8 mm. long, 3 mm. thick, densely fulvus pubescent. Inflorescence 5 to 8 cm. long, erect, axillary, pale green and densely fulvus tomentose, the usually solitary spike flower bearing from near the base where it is subtended by a series of imbricating bracts; outer or larger bracts 5 mm. long, hairy on the outside and at the 2-toothed apex; pedicel similary pubescent, 5 mm. long, subtended by a linear 3 mm. long externally hairy bract; flowers deciduous, slightly fragrant; calyx brownish, obconic, 5 to 7 mm. long, nearly as wide across the apex, densely covered on the exterior with olivaceous woolly hairs; segments about 10, on an average 2 mm. long, diverse in shape, inserted from the calyx rim, similarly pubescent on the outer side and usually on the exposed inne side toward the apex, obovate, broadly lanceolate, linear or irregular and unsymmeterical; petals apparently none; stamens numerous, inflexed in the bud state, inserted upon the throat; the longer filaments 4 mm. long, glabrous except toward the brown pubescent base, the inner ones shorter; anther basifixed, ovoidly ellipsoid, less than 0.75 mm. long, laterally dehiscent; the short ellipsoid ovary pubescent when young but soon glabrous; style fleshy, 3 mm. long, glabrous, bearing a minutely rugose flattened stigma. Fruits upon 7.5 mm. long puberulent stalks, 1 cm. across, somewhat immature, glabrous, slightly compressed, apparently only 1-seeded, occasionally creased longitudinally along its sides.

Type specimen number 11729, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered this large tree species in deep fertile soil on the south side of the Baruring river of the mount Apo forested basin at 3500 feet altitude. The Bagobos call it "Bacad."

Pygeum rubiginosum Elm. n. sp.

Large tree; trunk 17 m. high and 7 dm. thick, branched from above the middle; wood moderately hard, whitish at least on the outside; bark smoothish, brown on the stem and gray on the branches, the twigs fulvus tomentose. Leaves rubiginously colored when dry, chartaceous, lucid green on the upper conduplicate surface, paler green or even yellowish so beneath, oblongish or broadly lanceolate, the larger blades 12 cm. long by 5 cm. wide below the middle, margins entire, gradually tapering to the acute point, base obtusely rounded or abruptly subcuneate, with a large pair of elongated glands at the base, puberulent on both sides especially so along the midvein and nerves, otherwise the upper side becoming nearly glabrous with age; midvein conspicuous beneath, fulvus tomentose on both sides, the oblique 6 to 9 lateral nerves archingly united at their ends, the cross bars evident on the nether side and similarly pubescent; petiole 1 to 1.5 cm. long, yellowish brown puberulent, nearly glabrous when old; bud bracts tomentose, 5 mm. long, ovate and acutely pointed. Spikes usually solitary, yellowish green and densely fulvus lanose, varying 3 to 7 cm. long, ascending, at the base subtended by very minute bracts, flower bearing from near the base; buds sessile, also subtended by densely hairy bract vestiges, obovoidly ellipsoid, irregularly scattered; pedicels very short or none; calyx urceolate, 5 to 7.5 mm. long including the segments, densely rubiginose pubescent; segments 5 or more, 2 mm. long, frequently smaller, erect or inwardly curved, triangularly acute or obtuse, similarly hairy; petals small or obsolete, thick and linear, pubescent or subglabrous, inserted upon the calyx orifice; stamens very numerous, inserted around the throat of the calyx; filaments strongly inflexed in the bud state, glabrous, very unequal in length, averaging 1.5 mm. long or becoming elongated in complete anthesis; anthers basifixed, ovately ellipsoid, bilobed at base, rounded at apex, 0.5 mm. across; ovary reddish brown hairy, ellipsoid, 1.5 mm. long; style thick, as long or longer, glabrous, bearing a thick obscurely lobed rim-like stigma. Fruit ellipsoid, 1.25 cm. long, glabrous, apparently only 1-seeded, thick walled, deep red when mature.

Type specimen number 11857, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909. Number 14067 from mount Urdaneta is the same.

This large forest tree was discovered in fertile humus covered soil of the humid mount Apo forested basin at 4000 feet altitude. "Bucad" is its Bagobo name.

Not at all *P. fragrans Elm.* Fruits differ from those of *P. glandulosa Merr.* and *P. preslii* of the same author.

Pygeum gitingense Elm. n. sp.

A small tree; stem 7 m. high, 2 dm. thick, branched above the middle; wood hard, reddish toward the center, quite heavy, both odorless and tasteless; bark smoothish, grayish brown; twigs numerous, lax, minutely lenticelled, glabrous. Leaves rather numerous, alternatingly scattered, broadly lanceolate oblong, glabrous, curing brown, ascending, coriaceous or subchartaceous, curvingly conduplicate on the upper very much deeper shining green surface, the acute to acuminate apex usually somewhat twisted, entire, base obtuse to acute, 1 dm. long, 3 cm. wide; midvein grooved on the upper side, edged and reddish brown beneath; the 5 lateral nerves oblique and be coming obsolete toward their ends, reticulations none; petiole also glabrous and reddish brown, caniculate along the upper side. Infrutescence upon 1 to 3 cm. or even 5 cm. long stalks, axillary, flowering state apparently pubescent, angularly striate; pedicel thick, 5 mm. long, leaving scars after falling; fruit globose or nearly so, 1.5 cm. in diameter, slightly creased along its sides, 2-seeded, whitish or yellowish white, then bright red and finally shining black on the same tree; seeds plano-convex.

Type specimen number 12137, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, March, 1910.

Discovered in moist gravelly soil on wooded banks along the south fork of the Pauala river at 750 feet altitude.

Quite similar to *P. fragrans Elm.* and to *P. glandulosa Merr.* Certainly it is not *P. preslii Merr.* It also closely approaches *P. lanceolatum Hook.*

Pygeum microphyllum Elm. n. sp.

A low shrubby tree; twigs numerous, reddish brown, glabrous, blackish when dry, the younger parts slender and wrinkled in the dry state, their tips pulverulent to puberulent, the terete older branches grayish mottled. Leaves also numerous, ascending, alternatingly scattered along the twigs, glabrous, nearly flat, sublucid above, drying brown, paler green beneath, entire, the short acute or obtuse tips recurved, base obtuse or obtusely rounded, oblong, 4 to 5 cm. long, 1.5 to 2 cm. wide at the middle, without basal glands; midvein dark brown, prominent beneath, channelled on the upper side; the lateral nerves 4 to 6 on each side, ascending much less prominent, the anastomosing of their tips not visible beneath but plainly marked on the upper side, reticulations relatively coarse and barely visible from beneath, easily seen from the upper side. Inflorescent spikes from the uppermost leaf axils, 1 to 3 cm. long, usually solitary, much angled in the dry state, brown pubescent; pedicels few, divaricate, similarly angled and alike in vestiture, subpersistent, terminated by the expanded perianth rim; bud ellipsoid, light fuligineously pubescent, segments 2 to 3 mm. long, 5 of the larger ones and 5 of the smaller alternating with each other, obtuse, less than 1 mm. long, similarly pubescent on the exterior and on the inner side toward the apex; petals apparently none; stamens about 15, incurved, inserted upon the rim of the perianth; filaments glabrous, 1 mm. long, at least subterete; anther basifixed, short ellipsoid or ovoidly so, at least 0.5 mm. long; ovary 1 mm. long, ellipsoid, glabrous; the fleshy style a trifle longer, glabrous; stigma disk-like. Fruits 1 cm. high, equal in width, vertically creased along the sides, terminated by a low stout point, basal portion more tapering than the apical portion, apparently only 1-seeded.

Type specimen number 13198, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This small leaved *Pygeum* was among the many new ones gathered on a day's trip to the rocky summit region at 4000 feet altitude of mount Pulgar, where with other low interlaced rigid shrubs they form a dense blanket of chaparral vegetation.

Very distinct from *P. gitingense Elm.* and is apparently closely related to *P. maingayi Hook.*

Pygeum pulgarense Elm. n. sp.

Scrubby tree; twigs relatively short, rigid, terete, the young portion densely umber colored tomentose, with age becoming glabrous. Leaves alternate, ascending or horizontal, the entire margins slightly involute in the dry state, elliptic or subrotund, apex abruptly short acute or merely rounded, base obtuse, with or without glands, rigidly coriaceous, the normal lamina 7 by 10 cm., the upper side when young umbrinus puberulent but when old glabrous, beneath olivaceous puberulent and subglabrous ultimately; midvein prominent, short pubescent on both sides, also becoming glabrous, the 7 to 8 lateral pairs rather sharply edged beneath, similarly hairy and becoming glabrous on both sides, their ends forked and obscurely anastomosing, reticulations coarse and a trifle more evident from the upper side; petiole 3 mm. thick, 1 cm. long, velvety olivaceous pubescent, ultimately turning blackish and pulverulent; bud bracts 4 mm. long, densely tawny tomentose; flowers scattered from near the base where it is subtended by hairy bract vestiges; calyx subcampanulate, densely reddish brown hairy on the exterior and for some distance below the rim on the interior, 5 mm. long, nearly as wide; segments about 10, rather minute, 1 to 2 mm. long or even less, relatively narrow and irregular in shape; petals none; ovary tawny sericeous; stamens inserted upon the calyx rim.

Type specimen number 13200, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In the chaparral vegetation of the rocky summit of mount Pulgar at 4000 feet altitude.

Nearest to *P. coccineum Elm.*, but our leaves are not strictly obtuse nor entirely glabrous, never ovately elliptic, base not at all so broad and obtusely rounded or subtruncate and averaging considerably less in size. It also resembles *P. persimile Kurz.*

In 1910 I collected on Sibuyan island, two numbers 12130 and 12214 respectively in flower and in mature fruit of *Angelesia splendens Korth.* which material was distributed under a new name of *Parinarium.* The following year it was again collected on Palawan island where it is very common.

LEAFLETS OF PHILIPPINE BOTANY

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PHILIPPINE GYRINOPSIS

by

A. D. E. Elmer

Gyrinopsis brachyantha Merr.

So far only known from the province of Cagayan, Luzon.

Gyrinopsis cumingiana Decne.

Scattered throughout the Philippines, but nowheres abundant.

Gyrinopsis cumingiana pubescens Elm. n. var.

Erect tree, 5 m. high; stem 12 to 15 cm. thick, erectly branched from below the middle; wood soft, white, odorless, with a faint sweet taste; bark ashy gray, mottled, smooth; branchelets spreading, twigs slender and glabrous. Leaves horizontally spreading, thickly coriaceous, alternate, glabrous and deep dull green above, much lighter green beneath and soft pubescent, nearly flat, the entire margins recurved especially in the dry state, drying brown on both sides, elliptically oblong, obtuse or rounded at base, short acuminately constricted at the recurved apex, the larger ones 15 cm. long by 6 cm. wide at the middle, occasionally much smaller; midvein conspicuous beneath, hirsutely pubescent, impressed yet glabrous along the upper side; nerves relatively obscure, divaricate and slightly curved, from 15 to 20 on each side, quite irregularly scattered, also pubescent beneath; petiole thick, becoming subglabrous, 5 mm. long. Infrutescence terminal, descending, 1 to 3-branched, the slightly hairy or subglabrous stalks 10 to 15 mm. long and rather thick; capsule pendant, orange red, 1.5 cm. long, slightly obovoid or broadly ellipsoid, thick, apex apiculate, base short stipitate and subtended by the persistent 1 cm. long calyx tube which is slit open along its ventral side and bearing the crown of 4 obtusely rounded calyx segments, 2-celled and 2-seeded, 4-lobed with two very deep longitudinal depressions; seeds 7.5 mm. long, ovoidly compressed, pointed at apex, base rounded and set upon a whitish caruncle, smooth.

Type specimen number 10981, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Collected in well drained soil of woods along a ridge of the Baracatan creek at 1750 feet altitude. The Bagobos call it "Pamalunyan."

Primarily distinguished from the species by its pubescent under leaf surfaces. *William's* number 2724 from Santa Cruz of the same district is the same.

Gyrinopsis urdanetense Elm. n. sp.

Slender erect shrub; stem terete, 3 to 5 cm. thick, 7 to 4 m. high, branched toward the top; wood moderately soft, white, odorless and tasteless; back grayish white, smooth, green beneath the epidermis, sappy white on the inner side; branches relatively short, rebranched, the twig portion glabrous and terete. Leaves numerous, alternating, scattered along all the branchlets, elliptically oblong or broadly lanceolate, base acute, apex acuminately pointed, the longer blades 8 cm. long by 2.5 cm. wide at the middle, ascending, flat but recurved, much lighter green beneath, curing nearly equally dull green an both sides, subchartaceous, only the young ones strigosely pubescent; the entire margins somewhat curved upon the nether side, conspicuously rugose in the dry state; petiole also glabrous or with few hairs, 5 mm. long; midvein conspicuous beneath, brownish, glabrous or sparingly strigose; nerves very fine and numerous, divaricate, occasionally more conspicuous ones interspersed. Flowers usually 2 to 3 clustered, axillary, subpendant, yellowish or more green toward the base; pedicels green, greenish gray in the dry state, puberulent, up to 5 mm. long, free or when in clusters arising from a short common stalk, becoming easily detached, subglabrous, subtended by rather thick and pubescent bracts; perianth tubular, 7.5 mm. long, glabrous except the inner surface toward the base, 3 mm. thick; lobes 5, erect, triangularly oblong, obtuse at apex, 2 mm. long; stamens 10, inserted a trifle below the throat, in 2 rows, the upper row opposite the perianth lobes, the lower row alternating with them; scales obsolete; filaments hyaline, 0.75 mm. long; anthers as long and broadly oblong, also whitish, emarginate at both ends; ovary short ellipsoid, upon a thick silky hairy stalk; style glabrous, short, bearing a subroseus fluted stigmatic cap. Capsule also pendant, 12.5 mm. long, aurantiacus, obsurely 4-creased, obovoid, in the dry state nearly 1.5 cm. long, 1.25 cm. wide across the truncately rounded apex, glabrous, upon a 3 mm. long pedicel which is subtended by the persistent calyx vestige, 2-celled, 2-seeded; seeds ovoid, flattened on the ventral side, smooth, pointed at apex, upon a caruncled stipe, blackish brown, 1 cm. long, creased along the back.

Type specimen numbers 13742 and 14195, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September and October respectively, 1912.

Discovered in wet rather compact soil on a moss covered wind swept forested ridge at 5750 feet altitude. Rather common as an undershrub throughout the forests in the higher elevation. "Mangod" or "Macolan" is its Manobo name.

Gyrinopsis citrinaecarpa Elm. n. sp.

Suberect tree; stem 2 dm. thick, 8 m. high, branched from below the middle; wood soft but tough, white, rather light, odorless and without taste; bark dull gray and mottled, smoothish, dingy white except the epidermis; branches horizontal or descending, crookedly spreading, tough and flexible, terete, the young portions olivaceous tomentose. Leaves similarly spreading, coriaceous, oblong or the larger ones obovately so, obtuse or subcuneate at the base, apex more or less rounded and acutely pointed, the larger blades 1 dm. long but usually smaller, 3 to 5 cm. wide above the middle, shinny and glabrous on the upper flat side, densely olivaceous or velvety tomentose beneath, tips recurved, alternatingly scattered; margins entire, coarsely wrinkled in the dry state, somewhat recurved in the fresh state; midvein prominent beneath and velvety hairy, glabrous and impressed on the upper side; nerves very obscure, 15 to 20 can be counted on each side, irregularly scattered; petiole thick, 3 mm. long, pubescent. Inflorescence in several flowered clusters, axillary or along the twigs, odorless, deciduous, greenish, suberect, densely tomentose, sessile or arising from short common stalks, subtended by minute hairy bracts; pedicels 3 to 5 mm. long, pubescent, yellowish green; perianth nearly 1 cm. long, 3 mm. thick, similarly pubescent, terminated by 5 rotately spreading lobes; segments 3.5 mm. long, elliptic, puberulent on both sides, yellow; scales 10, with a fair opposite each perianth segment, erect, exerted, bearing a dense brush of hairs; stamens also 10, subsessilely inserted around the upper portion of the tube and immediately beneath the scales, alternating and opposite with the 5 pairs of scales; anther broadly oblong or obovoidly so, 1.5 mm. long; ovary thickly clavate, pulverulent, 5 mm. long, 1.5 mm. thick above the middle, bearing a sessile darker brown rugose stigma. Fruit a bright yellow or citrinus capsule, 15 mm. long, at least 10 mm. thick, subtruncate at both ends, 2-celled and 2-seeded, strongly impressed on two sides, subtended by the calyx vestige.

Type specimen number 13566, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered in moist compact soil of wooded ridges leading up to the sumit of Duros peak at 4000 feet elevation. Rather common! The natives or Manobos call it "Agododan."

This species though closely related to *G. cumingiana pubescens Elm.* is not indentical with it.

LEAFLETS OF PHILIPPINE BOTANY

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PHILIPPINE POLYOSMA

by

A. D. E. Elmer

Polyosma philippinensis Merr.

The type is from mount Mariveles and is rather common in the hill forest of middle Luzon.

Polyosma verticillata Merr.

This is quite common on mount Santo Tomas, Benguet province, Luzon, the type locality. Several distributions were sent out under *P. philippinensis Merr.*

Polyosma retusa C. B. Rob.

This fine species is only known by a specimen collected by the author at Infanta, Tayabas province, Luzon. The specimen is in both flower and fruit.

Polyosma piperi Merr. ms.

The type number 519, is a specimen collected by *C. V. Piper*, at Hinatuan, province of Surigao, Mindanao, May, 1911.

Polyosma apoensis Elm. n. sp.

A slender tree; stem 12 cm. thick, 7 m. high, terete, branched from below the middle; wood sappy white, without odor or taste, quite soft; bark mottled and smooth; branches more or less spreading, laxly rebranched, the ultimate ones subterete; twigs greenish, suberect, pulverulent especially the young portion. Leaves scattered along the branchlets, opposite or subopposite, fusiformly elliptic or oblongish, acuminate at apex and usually terminated by a minute point, base acute to subcuneate, margins entire and somewhat recurved in the dry state, curing very unequally dull brown, ascendingly spreading except the recurved apical portion, submembranous, glabrous and dull deep green above, paler and olivaceous pulverulent along the midvein and nerves beneath, the blades varying from 5 to 10 cm. long and from 2.5 to 4 cm. wide across the middle, petiole 2 cm. long at most, caniculate, yellowish, puberulent; midvein bold beneath, grooved above, the 6 to 9 lateral pairs quite conspicuous and divaricate, coarsely anastomosing from above the middle, all yellowish pubescent. Infrutescence greenish, suberect, spicate, 10 to 15 cm. long; the rachis densely olivaceous tomentose, terete, the peduncle proper only a few cm. long and subtended at the base by a series of small bracts, densely tawny pubescent; pedicels 4 mm. long, ascending, similarly pubescent, irregularly scattered; young fruits 5 to 7 mm. long, ovoidly ellipsoid, puberulent, crowned by the 5 persistent and pubescent calyx teeth, subtended at the base by 3 small similarly hairy bracts the middle one of which is a trifle larger.

Type specimen number 10797, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered in dry yet fertile well drained soil along a forested ridge at 4000 feet of mount Calelan. The natives or Bagobos call it "Magsangad."

Closely related to *P. philippinensis Merr.*, *P. verticillata Merr.* and to my *P. gitingensis*. Our leaves are not verticillate, lateral nerves and fruits not as in may Sibuyan specimens and our leaves as well as the pubescent ovoidly ellipsoid fruits are smaller than in the first species mentioned, under which name it was distributed.

Polyosma gitingensis Elm. n. sp.

An erect tree-like shrub; stem 5 cm. thick, 4 m. high, terete, branched from below the middle; wood dingy white, odorless and tasteless, rather soft in texture; bark gray, minutely checked, otherwise smoothish; branches more or less spreading, laxly rebranched, the ultimate ones suberect, grayish, terete; young portion of twigs ascendingly curved, roughened by the lighter gray leaf scars, the green terminal ends olivaceous puberulent. Leaves mostly toward the end of the twigs, opposite, broadly lanceolate or oblongish, horizontally spreading but strongly recurved toward the slenderly acuminate to caudate apex, base subcuneate, glabrous, thinly coriaceous, shining green above but curing nearly black, duller and subglaucescent beneath even so in the dry state, entire, the blades ranging from 5 to 8 cm. long and from 1.5 cm. to 2.5 cm. wide across the middle; midvein prominent beneath, grooved along the upper side, the divaricate 10 to 15 lateral nerves very obscure; petiole slender, averaging at least 1 cm. long, glabrous or pulverulent along the upper caniculate side. Inflorescence when in full flower fragrant, spicate, terminal, solitary, erect, 3 to 5 cm. long or even twice as long; peduncle green and puberulent, rather, stout and less than one third the whole lenth, at the base subtended by a series of linear pubescent 5 mm. long bracts; pedicel also green, 1.5 mm. long, short brown pubescent; calyx a trifle longer, similarly pubescent, subtended by 4-apiculate bracts, the 4 teeth broadly triangular and tomentose; petals of the same number, 7 mm. long, 1.5 mm. wide toward the base, linear, cinereous pubescent especially on the inner side, valvate and in the bud state appearing creased, ultimately promiscuously spreading, the upper one half only 1 mm. wide; stamens 4, alternating with the petals; erect filaments strict, flattened, 3 mm. long, glabrous except the hairy upper portion of the ventral side; anther somewhat shorter, linear and nearly as wide as the filament, with stout connections, the sacs laterally dehiscent; style 6 mm. long, dark brown or nearly black, glabrous, wand-like, the stigma slightly notched. Fruits upon 3 mm. long ascending and pulverulent pedicels, perfectly globose, 4 mm. in diameter, short pubescent but at maturity apparently nearly glabrous, bearing the subpersistent calyx teeth.

Type specimen numbers 12437 and 12206, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May and April, 1910.

Found in reddish compact humus covered soil of a forested ridge at about 3000 feet altitude. The local Visayan name is "Baybatuan."

Critically distinguished from *P. philippinensis Merr.* by its more acuminately pointed leaves, less conspicuous nerves, shorter flowers and by its much smaller and perfectly globose pubescent fruits.

Polyosma pulgarensis Elm. n. sp.

Shrubby; twigs terete, 5 mm. thick, gray, the young portion blackisk or dull yellowish tomentose. Leaves sublucid above when old, crowded toward the ends, opposite or subopposite, rigidly coriaceous; petiole stout, 1 cm. long, similarly tomentose; blade 5 to 7 cm. long by 2.5 to 3.5 cm. wide, elliptic although more tapering at the obtuse base, broadly rounded at the apex and with a mucronate point, entire margins revolute in the dry state, the young leaves densely olivaceous velvety on both sides, the old ones much less so and without the characteristic color; midvein strongly raised beneath, grooved along the upper side, the 5 to 8 lateral divaricate nerves much less conspicuous and coarsely anastomosing toward their ends, reticulations obscure. Spike erect, terminal, solitary, barely exceeding the foliage; rachis stout, angled, 5 to 8 cm. long, the basal 2 cm. without flowers and therefore the peduncle proper subtended at the base by a series of yellowish shining bracts, umbrinus tomentose; flowers similarly tomentose, irregularly scattered or clustered in rather dense spikes, sessile, each subtended by 3 very small bracts or mere vestiges of them; calyx thick, at least 3 mm. long, densely reddish brown pubescent, terminated by 4 broadly triangular teeth; corolla of an equal number of petals which in the bud state are valvate, nearly 2 mm. wide below the middle or toward the base, densely fulvus on the exterior, grayish white hairy on the inner side, less so toward the base, the upper two thirds barely wider than 1 mm.; stamens 4, alternating with the petals; filaments 4 mm. long, linearly lanceolate, flattened, ciliate hairy; anther narrower, 2.5 mm. long, outwardly curved toward the apex, linear, laterally dehiscent; connection large, terminated into a mucro; style strict, 7 mm. long, terete, glabrous toward the base, otherwise with olivaceous strigose hairs; stigma subcapitate, pulverulent.

Type specimen number 13187, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Quite rare in the chaparrel formation on the rocky summit region of mount Pulgar at 4200 feet altitude.

Polyosma cyanea Elm. n. sp.

A suberect shrub-like tree; stem 2 dm. thick, 8 m. high, crooked, subterete, mainly branched toward the top; wood soft, the very thin outer portion white, otherwise isabellinus, heavy; bark thick, scaling in yellowish gray plates, the middle portion isabellinus, the inner side whitish; limbs spreading and laxy rebranched, the green twigs ascendingly curved, soft puberulent especially the young portion. Leaves scattered, opposite, subcoriaceous or chartaceous, very dark shining green on the upper glabrous side, paler green beneath even in the dry state, oblong, acute to acuminate at apex and apiculately pointed, base obtuse or occasionally subrotund, the large blades 5.5 cm. wide by 15 cm. long, entire or occasionally apiculate, minutely pubescent beneath; petiole soft dirty yellowish pubescent, 2 cm. long, slender, grooved along the upper side, green; midvein prominent beneath, densely hairy as well as along the sunken upper side, the 7 to 9 divaricate lateral nerves also conspicuous and pubescent, coarsely anastomosing, reticulations quite prominent on both sides. Spike 1 to 2 dm. long, obscurely angular or striate, greenish pubescent, usually subtended by small densely hairy bracts, fruit bearing from near the base, slender; pedicels of the fruits ascending, relatively stout, less than 5 mm. long, densely pubescent, after falling leaving conspicuous white scars; fruits ascending, ovoidly elongated, rugose and ovoidly acuminate in the dry state, nearly 1.5 mm. long, one half as wide below the middle, glabrous except the crown of small pubescent calyx teeth, deep cyaneus when ripe, subtended by 3 sharply pointed and pubescent bracts, the middle one of which is a trifle large.

Type specimen number 13670, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in compact more or less stony and well drained soil on a steep wooded slope of Cawilanan peak at 4250 feet altitude.

Very near to *P. piperi Merr.* based an *Prof. C. V. Piper's* number 519 from Hinatuan, but ours is distinctly alpine, leaves curing bright green, with more prominent nerves and with a denser pubescence; our fruits are much more tapering in the dry state than in *Piper's* plant.

Polyosma urdanetensis Elm. n. sp.

Crooked tree; stem 6 dm. thick, irregularly round, crooked and suberect, 12 m. high, branched toward the top; wood dingy white, quite without odor and taste, not hard but very tough; bark very thick, latericius, somewhat checked on the surface, the outer one half beneath the epidermis yellowish, the inner portion whitish, easily peeling from the wood; main branches few, also crooked, rebranched; twigs ascendingly curved, dull green, glabrous, rather long and sparingly rebranched. Leaves thick and leathery, ascending, glabrous, lucid dark green and shallowly folded on the upper side, paler green beneath, drying very unequally blackish on the two sides, diverse in size, the larger blades 2 dm. long, 9 cm. wide above the middle, obovately oblong, the smaller ones less than one half as large and broadly oblanceolate, apex broadly rounded or obtuse, base obtuse or more frequently subcuneate, margins entire in the dry state at least recurved; midvein raised beneath, narrowly grooved along the upper side, black, glabrous, the 10 to 15 divaricate lateral pairs less prominent and coarsely anastomosing toward their ends, reticulations equally visible from both sides; petiole stout, glabrous, black when falling. Spike erect, terminal, glabrous and green, 1 to 1.5 dm. long, stout, obscurely angled or striate, not equalling the foliage, flower bearing from the near the base, subtended at the base by a small pair or two of terminal leaves; pedicels 5 mm. long, rigid, olivaceous pubescent, terminated at the apex by 3 low bracts; calyx fully as long and about as wide across the 5 rigidly dentate apex, thick, subtended on the lower side at the base by 3 very unequal bracts, the middle one being twice as large, all of them thick and rigid; corolla bud yellowish gray pubescent;

the 4 petals valvate, cremeus, 1.5 cm. long, ligulate, very coriaceous, 2.25 mm. wide, pubescent on the inner side except at the very base; stamens 4, alternating with the petals; filaments 6 mm. long, thick and compressed, pubescent, 1 mm. wide; anther a trifle less in length, about as wide, outwardly curved toward the apex, irregularly truncate at apex; style relatively thick, thinnest below the middle, the upper portion longitudinally strewn with rather large glands; stigma large, rugose. Fruit hard, green, ovoidly ellipsoid or oblong in shape, rugosely angled toward the blackish brown apical point which in the dry state is grayish and surrounded by the 5 apiculate calyx teeth, 2 cm. long, nearly 1.5 cm. thick below the middle, upon 5 to 7 mm. long pedicels.

Type specimen number 13793, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Only one tree was discovered in a cold moss covered wooded depression near a wind swept summit ridge at 6250 feet elevation of Masay peak or as mount Urdaneta is called by the natives. The Manobo name for this plant is "Yangitosan."

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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PHILIPPINE TRICHOSPERMUM

by

A. D. E. Elmer

Trichospermum trivalvis Merr.

Here and there throughout the Philippines in secondary forest of the foothills.

Trichospermum mindanaensis Merr.

Based upon a collection made by *Mrs. Mary Strong Clemens* in the lake Lanao region of central Mindanao.

Trichospermum involucrata (Merr.) Elm. n. comb. *Halconia involucrata Merr.* in Philip. Journ. Sci. II; 281, 1907.

Founded upon *Merrill's* own collection made on mount Halcon. Otherwise not known.

Trichospermum negrosensis Elm. n. comb. *Halconia negrosensis Elm.* Leaf Philip. Bot. II; 395, 1908.

Neither has this species been collected since the discovery of it in the Cuernos mountains of southern Negros.

Trichospermum discolor Elm. n. sp.

A medium sized tree; stem 15 m. high and 6 dm. thick; wood soft, white, odorless and tasteless; bark 2.5 cm. thick.

smoothish or obscurely lenticelled, gray, brown and easily stripping on the branches, reddish brown beneath the epidermis; branches widely spreading, the ultimate ones slender and horizontal; green twigs minutely lenticelled, the young portion pulverulent. Leaves horizontal or descending, submembranous, usually folded upon the upper deep green surface which is sprinkled with very minute stellate tufts, grayish green and finely tomentose with stellate hairs beneath, alternate, when dry blackish brown above and grayish beneath, ovately oblong, 15 cm. long by 6 cm. wide across the middle or below it, frequently smaller, truncately rounded or occasionally shollowly cordate, at base gradually tapering to the acute apex; margins very finely serrate except the entire base; petiole 1 to 1.5 cm. long, stellately pubescent; stipule semilunar, 7.5 mm. long, nearly 3 mm. wide, sparsely hairly, veins ascending, 3 from the base, conspicuous and yellowish stellate, with 3 or 4 extra pairs from above the middle, cross bars quite conspicuous, reticulations obscure. Inflorescence erect or nearly so, from the leaf axils, green except the brown buds, 3 to 5 cm. long, few branched from the middle or above it; peduncle densely covered with the short tawny stellate hairs, so also the secondary divaricate stalks or branches which are subtended by bracts; flowers in small umbellate clusters subtended by an involucre of green bract; bracts unequal in size and in number, averaging 1 cm. long, 3 to 5 mm. wide at about the middle, usually running into a fine point, contracted toward the base, lanceolately oblong, covered with a yellowish appressed dense stellate tomentum; calyx segments 4 or 5, thick, early falling, bluntly oblong, toward 8 mm. long, densely and stellately yellowish pubescent, 3.5 mm. wide at the middle, finely papilose on the inner side especially above the middle; petals 5, narrowly oblong, 6 mm. long, 2.25 mm. wide, obtuse at apex, pulverulent and glandular on the back, bearing on the inner side at the base a dense tuft of hairs; stamens very numerous around the basal portion of the ovary, among dense numerous hairs; filaments glabrous, very unequal in length, averaging 1.5 mm. long, thickened at the base; anthers broadly cordate, 0.25 mm. thick; ovary densely hairy, ellipsoid, bearing a more or less expanded and rugose stigma. Capsule nearly 1.5 cm. long by

12 mm. wide below the middle, much flattened and impressed longitudinally on the sides, ovately oval from the side view, densely fuligineously hairy but becoming nearly glabrate when old, apex usually emarginate and apiculate, short stipitate at base, 2-celled; seed dark brown, very flat, 2 mm. across, with a dense corona of yellowish white hairs around the edge, numerous.

Type specimen number 11903, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, October, 1909.

Gathered on moist wooded slopes at 3000 feet altitude on the Talon side of the mountain range or about due south of mount Apo.

Leaves somewhat smaller, less pubescent and quite characteristically grayish white beneath; capsules also smaller and less pubescent than in *T. mindanaensis Merr.* under which name it was distributed.

Trichospermum cuneata Elm. n. sp.

Dwarfed tree; stem 2 dm. thick, 7 m. high, crooked and subterete; main branches arising from below the middle, spreading, quite rigid, the ultimate ones subterete; wood moderately soft, white at least on the outside, without odor or taste; bark smoothish, mottled; twigs fulvous tomentose; bud bracts numerous, oblong, widest at the base, less than 1 cm. long, slightly hairy. Leaves alternate, rigidly chartaceous, slightly ascending, nearly flat, shining deep green and finely stellately pubescent on the upper surface which with age becomes glabrous, grayish or yellowish green on the stellately pubescent nether side, the average lamina 1 cm. long by 5 to 7 cm. wide above the middle or at it, cuneately elliptic or occasionally short elliptic, base rounded, apex broad and truncately rounded, emarginate or with a minute point, margins entire especially around the base; veins 3 from near the base, the two lateral ones ascending pairs usually with only 3 additional less ascending pairs, all prominent beneath, cross bars not conspicuous, stellate yellowish hairy; petiole velvety pubescent, stout, 2 to 3 cm. long; stipule lanceolately linear, 8 mm. long and 3.5 mm. wide, less pubescent on the inner side. Inflorescence erect or ascending, arising from the uppermost leaf axils, pale green, 5 to 10 cm. long, densely tawny yellow, stellately pubescent, striate, few branched toward the top only; branches divaricate or ascending, subtended by similarly pubescent bracts, about 1 cm. long only; sepals 4, greenish oblong, valvate in the early state and forming an ovoid to ellipsoid bud 1.25 cm. long, acute to obtuse at apex, coriaceous, densely tomentose on both sides, 4 mm. wide across the middle, broad from the base; petals cremeus, 9 mm. long, 5 in number, occasionally smaller, 2.5 mm. wide above the middle, thickened at the base and densely hairy, also pubescent in the middle region on the back especially toward the base, obovately linear, truncately rounded at apex, veiny; stamens very numerous, scattered among olivaceous hairs around the basal portion of the ovary; filaments setiform, glabrous, ranging from 0.5 to 3.5 mm. long; anthers basifixed, deep brown, broadly reniform, 0.33 mm. wide; ovary large, bristly yellowish hairy compressed, obovoid, at apex short pointed; stigma glabrous, expanded, rugose. Capsule upon 1 cm. long similarly pubescent stalks, nearly 2.5 cm. wide and 2 cm. high, compressed, persistent, widely dehiscent, broadly oval, short stipitate at base, broad and truncate at apex with a distinct point, densely light fulvus tomentose, 2-celled, the membrane-like placenta fimbriately edged; seeds many, browe, lenticular, with ciliate hairs around the edge.

Type specimen number 12514, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910.

Discovered on a wind swept ridge at 4750 feet altitude, in red clay mixed with stones.

This also was distributed under *Halconia*, and is nearest related to *T. involucrata (Merr). Elm.* and to *T. negrosensis Elm.*

LEAFLETS OF PHILIPPINE BOTANY

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PHILIPPINE CURCULIGO

by

A. D. E. Elmer

Curculigo recurvata Dry.

The most common of our Philippine species, met in nearly all provinces of the different islands.

Curculigo glabra Merr.

The type is from mount Halcon and apparently is not common. At least the fruits are very similar to that of the above.

Curculigo orchioides Gaertn.

Quite common and usually found in cogonals. Variable in our islands.

Curculigo agusanensis Elm. n. sp.

Nearly acaulescent perennial herbs; roots copious, fibrous, the individual plants are occasionally connected by the 6 mm. thick rootstock or stolon. Leaves arranged in three rows, ascending, the central ones erect and slightly longer, few to several in a cluster; blade chartaceous, beautifully recurved toward the sharply acuminate to caudate apex, pale green yet still paler beneath, plaited on both sides especially toward the base, drying dull green, entire, glabrous, cuneately attenuate toward the base, oblanceolately elongated, 3.5 to 4.5 dm. long, 7.5 cm. wide a trifle above the middle; veins parallel, about 15, the middle one more conspicuous; petiole green, triangular, grooved along the upper side, sheathing toward or at the base, striate, glabrous except on the outside toward the marcescent base, erect, averaging 3 dm. long. Peduncle axillary, ascending, flattened, 3 to 5 cm. long, dirty lanose; florescent heads recurved or subpendant, 3 cm. long; lower bracts the longest, nearly equalling the cluster, linearly lanceolate, 5 mm. wide, glabrous or sparsely hairy toward the base on the dorsal side, slenderly acuminate toward apex; flowers short stipitate; ovary hairy and elongated, nearly 1 cm. long; perianth subsessile, spreading in anthesis, yellow especially on the upper nearly glabrous surface, elongated, 7.5 mm. long, nearly one half as wide below the middle, brown ciliate beneath or on the dorsal side, 6; stamens of the same number, alternating with the perianth segments; mature fruit indehiscent, 1 cm. long, 5 mm. thick, ellipsoid or ovoidly so, nearly glabrous, strongly rugose by the seeds upon drying; seeds black, stonelike, 2 mm. across, subglobose but usually a trifle pointed at the place of attachment, smooth.

Type specimen number 13584, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In moist fine gravelly or subsandy soil of a deeply shaded and humid flat at 750 feet altitude. Forming patches. "Pagatpat" is the Manobo name.

Nearest related to *C. glabra Merr.*, whose peduncles are much longer than in the species here proposed and which are as long as those of *C. recurvata Dry.*

Curculigo weberi Elm. n. sp.

Perennial herbs and without true stem; roots numerous, fibrous, arising from a crown. Leaves 3 to 5 in a cluster, the central ones more erect, the outer ones recurved; blades membranous, 3 to 4 dm. long, 7 cm. wide at the middle or narrower in the smaller lamina, paler green beneath even in the dry state, plicate especially toward the slenderly cuneate base, apex recurved and acuminate to caudate, lanceolately oblong or equally tapering at both ends, glabrous; parallel veins about 15, the middle one stoutest; petiole 2 or more dm. long, deeply grooved, edges green, gradually expanded and sheathing toward the base where it is often lightly hairy on the outer marcescent portion,, finely striate. Peduncle from the leaf axil, much compressed, at least 7 cm. long, suberect, more or less hairy; inflorescent head slightly tipped, rather loosely and few flowered; subtending bracts membranous, edges hyaline, 1 to 1.5 cm. long, lanceolate and with sharply pointed tips, glabrous or with a few hairs along the median dorsal region as well as at the apex; ovary ovoidly elongated, glabrous, 7.5 mm. long or less, one half as thick below the middle or at the base, terminated into a nearly glabrous perianth neck equally as long; segments probably 6, oblong, nearly 6 mm. long, 1.75 mm. wide, glabrous except the few strigose hairs along the middle region on the back, yellow; stamens alternating with the segments; nearly mature fruit 1.5 cm. long, ovoidly elongated, almost 1 cm. thick at the base, acuminately beaked, glabrous; seeds comparatively few, only 6 in the capsule dissected, black, smooth except for the blunt points marking the place of attachment, subglobose, toward 3 mm. thick.

Type specimen number 14304, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Found in wet earth of humid forested flats of *Dipterocarps* at 500 feet altitude. Named after *C. M. Weber* who also collected it in this same region.

Foliage is like that of *C. agusanensis Elm.* and *C. glabra Merr.*, but the short peduncle and beaked flowers in addition to the glabrous few seeded fruits are chararters sufficiently distinct from either.

Curculigo brevipedunculata Elm. n. sp.

Solitary perennial herbs, with very short stems or acaulescent; roots ample, fibrous, fleshy, yellowish. Leaves plicate especially toward the base, 4 dm. long or the smaller lamina only one half as long, 5 to 9 cm. wide across the middle, velvety dark green above, a trifle paler beneath, flat, membranous, drying blackish brown, escending but recurved toward the sharply acuminate apex, entire, attenuate toward the base, glabrous except for the few scattering hairs on the nether side below the middle, oblong or broadly oblanceolate; midvein edged beneath, the 10 lateral ones less conspicuous though parallel; petiole erect or ascending, 1 dm. long, dark green, deeply caniculate, dirty puberulent along the lower side, several from the same stem cluster, alternating, expanded end sheathing at the base. Inflorescence barely above ground, arising from the lower leaf axils, suberect; peduncle very short or 1 to 2 cm. long, yellowish brown hairy, ensiform or compressed; bracts whitish toward the base, averaging 2 cm. long, nearly one half as broad at the base, thinly membranous, broadly lanceolate, striately veined, acuminate to caudate at apex, pubescent along the margins and midvein on the nether side; flowers several and scattered, not in dense heads, odorless, suberect, the tube or beak pale white; ovary lanceolately elongated, soft hairy, terminated into a 2 cm. long similarly pubescent beak or perianth tube; perianth segments 6, rotately spreading, 7.5 mm. long, about 3 mm. wide across the middle, quite veiny, oblongish, rounded or somewhat constricted at the apex, glabrous except the middle region on the back and the tuft of hairs at the apex, bright yellow, alternating with small bract-like segments; stamens 6, alternating with the larger segments, divaricately spreading; filaments glabrous, 3 mm. long, strongly curved and twisted; anther somewhat compressed, as long as the filaments, with a thick back, narrowly oblong, apex truncate and slightly notched, base sagittately lobed, basifixed, 1 mm. wide, cell walls thin; erect style thick and fleshy, glabrous, strongly curved and twisted at the throat of the perianth, 5 mm. long, bearing an irregular capitate slightly bristly stigma; ovules numerous, stipitate, pendant from a central placenta; young fruit without the stout beak 1.5 mm. long, 7.5 mm. thick, ovoidly elongated, yellowish hairy, angular or subterete, white and becoming reddish brown, produced into a greenish neck nearly 2.5 cm. long.

Type specimen number **13164**, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Found scattered in humus covered fertile soil of dense forests at 750 feet altitude along the trail to Napsan. Also known from Balabac island.

It seems to be distinct from the forms under *C. latifolia Dry.*

MISSOURI BOTANICAL GARDEN 1859

LEAFLETS OF PHILIPPINE BOTANY

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PHILIPPINE LINCOCIERA

by

A. D. E. Elmer

Linociera luzonica (Blm.) Vil. *Chionanthus luzonica Blm.*

Fairly well scattered over our archipelago, but especially in the northern and middle portion.

Linociera cumingiana Vid.

This is very similar to the above species and may be identical with it.

Linociera philippinensis Merr. *Mayepae pallida Merr.* and *Linociera pallida Merr.* not *L. pallida K. Sch.*

Extends from middle Luzon southwards. The type is in flower, my number 13569 in fruit is an exact match.

Linociera racemosa Merr. *Mayepae racemosa Merr.*

The type is from mount Mariveles and apparently this species is not common.

Linociera acuminatissima Merr. ms.

So far only known from the island of Palawan, collected by *Mr. Curran.*

Linociera coriacea Vid.

This very little known species has large, thickly coriaceous leaves.

Linociera obovata Merr. ms.

This remarkable species is only known by a specimen collected at San Antonio, province of Laguna, Luzon.

Linociera rubrovenia Elm.

In subalpine regions of the middle and southern Philippines. Quite distinct in its conspicuous reddish brown veins.

Linociera nervosa Elm. n. sp.

Slender and medium sized tree; stem 6 dm. thick, 14 m. high, branched from the middle; wood moderately hard, white, odorless and without taste; bark smooth, grayish white and mottled; branches divaricate, laxly rebranched and spreading, the green twigs glabrous and somewhat flattened. Leaves curing brown, opposite, well scattering, horizontal or descending, coriaceous or rather subchartaceous, glabrous, dark lucid green on the upper surface, duller and paler beneath, entire, elliptically oblong or ovately elliptic, abruptly acute or even obtuse at the apex, base obtuse or occasionally broadly rounded, the average size of the lamina 1 dm. long and 4.5 cm. wide; petiole 1.5 cm. long, also glabrous, deeply channelled along the upper side; bud bract conspicuous, subterete, 7.5 mm. long, 4 mm. thick below the middle, ovoidly conical; midvein brown, edged; the lateral nerves 5 to 7 pairs, equally visible from both sides, oblique and only slightly curved, tips anantomosing, reticulations numerous and a trifle more evident from the upper surface. Infrutescence axillary, suberect; stalks 1 or 3 or even 5 in a cluster, 5 to 8 cm. long or less, terete, glabrous, stout, 2- to 3-short branched from the middle or about it, the shortest ones frequently unbranched, bearing at their extremities 1 to 2 or occasionally 3 fruits; true pedicel terete, thicker than the branchlets, 5 mm. long; fruits hard, bright shining green, ellipsoid or obovoidly ellipsoid in the dry state, at least 1.75 cm. long, 1 cm. thick above the middle, smooth, subtended at the base by the circularly thickened and subpersistent perianth disk, terete, apparently only 1-seeded.

Type specimen number 11833, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Collected in dense woods along the upper edge of a steep ravine south of the Baruring river at about 4000 feet altitude.

This was distributed under *Pygeum*, but it cannot be that genus.

Linociera gitingensis Elm. n. sp.

A small burly and suberect tree; stem 2 dm. thick, 8 m. high, branched from the middle or below it; wood hard, heavy, burly, reddish toward the center, odorless, bitterish; main branches widely spreading, the ultimate ones numerously rebranched; bark brown and gray mottled, lenticelled, smooth and whitish on the twigs; branchlets flattened at the point of leaf attachment. Leaves opposite, scattered but mostly toward the ends of the branchlets, ascending yet recurved toward the acute to obtuse apex, drying unequally grayish brown, glabrous, shining green above, much paler green and duller beneath on the minutely pustulate or coarsely pulverulent nether side, lanceolately oblong, base subcuneate or more narrowly tapering toward the basal portion, rigidly coriaceous, margins entire and smooth, the larger blades 2 dm. long by 5 cm. wide across the middle or their widest portion; midvein stout and reddish brown beneath; lateral nerves 6 to 8 on each side, straight, oblique, faint from both sides, their tips becoming obsolete, reticulations none; petiole glabrous, light ashy gray, terete, strongly curved, 1.25 cm. long, 3.5 mm. thick, flattened and shallowly grooved along the upper side, gradually extended into reddish brown petiole-like basal portion of the blade proper. Inflorescence ascending mainly from the uppermost leaf axils, glabrous, pale green but turning dull reddish in the dry state, varying from 4 to 7 cm. long, solitary or few from the same cluster; peduncle proper one third the entire length, subtended at the base by rigid and externally grayish brown covered acute bracts, otherwise paniculately branched; branchlets subtended by oblanceolate 5 mm. long bracts where margins in the dry state is subinvolute and usually somewhat hairy along the edges and upper surface; flowers in subumbellate terminal clusters or only few clustered or solitary; pedicel 6 mm. long at most, subtended by bracteoles which soon drop off; calyx thick, glabrous, 2.25. mm. long, ellipsoid; the 4 obtuse teeth finely ciliate margined; corolla squarrose, cremeus, glabrous, 3 mm. long, the basal two thirds united, the outer apical portion with few glands; teeth 4, obtusely rounded, the margins well folded over the inner side and even down into the tube; stamens 2, inserted upon the middle of the corolla tube and alternating with the segments; filament glabrous much flattened, 1.5 mm. long; anther basifixed, oval, 0.75 mm. across; ovary 2.5 mm. long, ovoidly elongated, glabrous, terminated by a sessile rugose stigma.

Type specimen number 12290, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, April, 1910.

Collected in gravelly soil along the edge of woods of the Pauala river at about 1000 feet altitude. Just recently I collected it again in the province of Agusan, Mindanao.

Related to *L. philippinensis Merr.* yet quite distinct from that species.

Linociera vidallii Elm. n. sp.

Erect tree; stem 2 dm. thick by 7 m. high; main branches not numerous, arising from the middle, divaricately spreading, ultimately numerously rebranched and forming an elongated crown; twigs lax, horizontal or the tips ascendingly curved, light gray and flattened at the point of leaf attachment; wood bitterish to taste and odor, burly, moderately hard, reddish toward the center; bark thick, yellowish gray, more or less roughened with blunt lenticels, reddish brown beneath the epidermis. Leaves opposite and scattered along the branchlets, coriaceous, flat except the sharply acute to acuminate recurved apex, glabrous, drying somewhat unequally brown on both sides, dark green above, much lighter so beneath, base acute or subcuneate and decurrent at the basal end, the entire margins subinvolute in the dry state, ovately elliptic to oblongish, the larger blades 13 cm. long by 5 cm. wide, midvein reddish brown and prominent beneath; the 7 to 9 lateral pairs of nerves slightly ascending and nearly straight, less conspicuous beneath, barely visible from above, their tips obscurely interaching; petiole grooved above, 1 cm. long or less, blackish brown in the dry specimen, gradually extended into the decurrent leaf base. Inflorescence suberect, spreading, axillary, solitary or few clustered, 1 dm. long or less, the peduncle proper less than one fourth the entire length and subangular, otherwise lax and paniculately branched; branchlets sparingly rebranched, longest at the base, subglabrous, subtended by short and obtusely pointed bracts; pedicel thick, very short or none, occasional with large dark reddish brown glands; subtending bracts ovate, subacute at apex, finely ciliate on the margins with fewer glands on the back; calyx 1.5 mm. long, composed of 4 segments, united at the base, glabrous or finely puberulent along the margins, acute, the exterior basal or middle region similarly provided with scattering glands; petals united at the very base only, yellowish, 4, at least 3 mm. long, coriaceous, glabrous, few gland dotted on the back, in bud induplicate, valvate, 1.25 mm. wide below the middle, the upper portion oblong and with a truncately rounded or merely truncate apex; stamens 2, at the base of the corolla and alternating with the segment; filaments short and broad; connective thick, slightly apiculate; anther broadly elliptic, 1 mm. long; ovary subglobose, glabrous, 1 mm. across, abruptly terminated into a short bifid stigma. Fruit upon very short thick stalks, and obovoidly ellipsoid or subglobose in the fresh state, hard, green, 1-seeded, 3 cm. long by 2 cm. thick.

Type specimen numbers 12127 in flower and 12810 in fruit, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, March, 1910: Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In both cases it was gathered in gravelly soil of wooded river banks at approximately 500 feet altitude.

Leaves similar to those of *L. rubrovenia Elm.* but at once distinguished by its inflorescence.

Linociera urdanetensis Elm. n. sp.

A rather small tree; stem 2.25 dm. thick, 8 m. high, subterete, somewhat crooked, mainly branched above the middle or toward the top; wood quite odorless and tasteless, white and yellowish tinged in the center, moderately hard; bark smoothish, yellowish gray, testaceus except the epidermis; branches slender, divaricate, well scattering along the branchlets, glabrous, descending or horizontally spreading, coriaceous, lighter green beneath, shallowly folded along the upper side, curing dull greenish brown, ovately elliptic to elliptically oblong, the average lamina 1 dm. long by 5.5 cm. wide, base obtuse or obtusely rounded, the same at the apex except the blunt or abrupt point which is emarginate at the point, the entire margins somewhat involute in the dry state at least; petiole 1 cm. long, glabrous, 2 mm. thick, reddish brown when dry; midvein conspicuously raised beneath, deeply grooved along the upper side clear to the apical point, also dark brown: lateral nerves about 6 pairs, relatively conspicuous beneath and grooved along the upper side, ascendingly curved, tips faintly anastomosing, reticulations obscure. Infrutescence ascending or horizontal, axillary or lateral, 2 to 7 cm. long, only sparingly short branched; the stalks thickened, solitary or few clustered, glabrous but apparently in the flowering state puberulent, nodulose or the branchlets articulate and subtended by short acute bracts; pedicels divaricate, thicker than the stalks, 5 to 7 mm. long, persistent, terminated by the 4 short yet acutely pointed calyx remnants; nuts obovoidly globose or as in the dry state obovoid, 1.5 cm. long, 1 cm. thick above the middle, dark green and with minute whitish spots, 1-seeded; seed surrounded by a yellowish crust longitudinally streaked on the exterior with atropurpureus.

Type specimen number 13835, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in the rocky soil above the lagoon at 5250 feet elevation of humid forests on a sheltered depression. "Cobol" is the Manobo name.

A very close ally of the preceding species and our flowers are as yet unknown. It is a high alpine plant, not a low river species, has slightly different leaves and much smaller fruits. A more distant relative is *L. coriacea Vid.*

Linociera grandifolia Elm. n. sp.

Small erect tree; stem 1 dm. thick, terete, 7 m. high, branched from above the middle; wood light, white, without odor and taste, slightly yellowish toward the center; bark greenish gray mottled, smooth; branchlets slender, very sparingly rebranched, the twigs grayish and flattened at the leaves. Leaves ascending or horizontally spreading far apart flat, chartaceous or submembranous, much paler or yellowish green on the velutinous nether side, pulverulent or subglabrous on the upper surface, broadly obtuse at the base, obtusely rounded at the apex and terminated by a short but sharp point, margins entire, elliptic or more elongated, 3 to 3.5 dm. long, 12 to 15 cm. wide; midvein stout and rounded beneath, flat and grooved along its sides on the upper surface, puberulent or velutinous beneath; petiole nearly 2 cm. long, ascendingly curved, terete, 5 mm. thick, very finely pulverulent; lateral nerves 10 to 15 on each side, subdivaricate, straight, very coarsely anastomosing or interarched at their ends, coarse reticulations or cross bars obscure. Iufrutescence lateral or axillary, either divaricately or ascendingly spreading, the rigid stalks puberulent and green but becoming reddish brown, subangular, usually in small clusters, 3 to 5 cm. long, only the largest ones with few short branches; nuts subglobose or distinctly obovoid in the dry state, 2.25 cm. long or less, 16 mm. wide above the middle or much less in smaller immature ones, subsessile, smooth, greenish, 1-seeded; seed of a dirty yellowish color with vertical dull purplish or bluish streaks or veins.

Type specimen number 13425, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

This small tree with large leaves was only once discovered in rich, damp and humus covered earth of a densely humid forested flat at 500 feet altitude. "Cobolan" in Manobo.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. V. Manila, P. I., June 13, 1913. Art. 87.

PHILIPPINE BALANOPHORA

by

A. D. E. Elmer

Balanophora altacea Jungh. in Nov. Act. Cur. XVII, suppl. I; 205, 1841.

Said to be described from the material collected by *Cuming* on the island of Luzon. Index Kewensis reduces it to *B. abbreviata Blm.*

Balanophora decurrens Fawc. in Trans. Linn. Soc. Lond. II^2; 234, 1886.

This species is founded upon a specimen sent to the British Museum by *Don J. G. Azaola* from Luzon in 1846.

Balanophora micrantha Warb. in *Perkins*' Frag. Fl. Philip. 169, 1905.

This is based upon *Mr. A. Loher's* alpine collection also made on Luzon.

Balanophora fawcettii Elm. n. sp.

Monoecious dense clusters; rhizome lobulate or rugose, tuberculate and pustulate, dirty yellowish, the pustules and cup rim of a lighter yellow even in the dry state; the individual cups short ellipsoid or subglobose, 2 cm. long when fully mature or much smaller, in the very young state similar to coarse honey-comb cells, irregularly bursting at the apex, very deeply cup shaped; stem pale yellow, varying from a few cm. to 1 dm. in length, glabrous, terete, blackish brown when dry, more or less than 5 mm. thick, erect, frequently crooked, alternatingly bracteate from the base; bracts ovately oblong, partly enclosing the stem at the base, the larger ones 2 cm. long by 1.5 cm. wide at the base, roundly obtuse at apex or notched, the uppermost one ovately oblong and smaller, glabrous on both sides, creamy white while the stem is of a deeper yellow, apical margin submembranous. Heads ovoidly ellipsoid or oblongish, 1 to 2 cm. long, 10 to 13 mm. wide below the middle, terete, pistilate only but immediately beneath and more properly upon the peduncle are the staminate flowers; male flower sessile and scattered, subtended by 2 pairs of involucral segments; the inner pair slightly smaller, the outer ones nearly 2 mm. long and fully as wide, all chartaceous and glabrous, concavo-convex; anther mass circular or oblongish, with about 10 or more hexagonal cells; dense female head appearing checkered, the fertile female flowers obovoid, blackish brown, pitted, short pedicellate, surrounded by much lighter brown sterile flowers or paraphyses, which are also upon stipes, are fusiform and bear slender darker brown styles.

Type specimen number 7613, *A. D. E. Elmer*, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

Rare in loose ground near the base of a fig tree in a damp ravine at 1750 feet altitude.

Very near to *B. hildebrandtii Reichb.*, but its few and scattering bracts are not imbricated and there are other differential characters. Named in honor of *Mr. W. Fawcett* who has written an excellent review of the genus in Trans. Linn. Soc. Lond. II^2; 233, 1886.

Balanophora subglobosa Elm. n. sp.

Small but dense fleshy clumps; rhizome spreading, yellowish white, tuberculate or minutely warty, the individual cups ovoidly oblongish and from 1 to 1.5 cm. long, the surface rugose or obscurely nodulose, irregularly splitting open at the orifice; stem fleshy, yellowish tinged, 3 cm. long, 3 mm. thick, subterete; bracts 3 to 5, glabrous, deeper yellow, oblongish, subinvolute in the dry state, more numerous toward the base where they are loosely imbricated, 1 cm. long or less, 7 mm. wide, not decurrent but somewhat clasping at the base, the basal ones relatively shorter and broader. Monoecious heads globose, 1 cm. thick, wrinkled in the dry state, pistillate but immediately beneath and more properly upon the peduncle with scattered staminate flowers; male flowers scattered, sessile, compressed, the buds well covered over by the apical portion of the perianth segments; lobes 4 or more, often 5, thick, oblongish, adnate, unequal in width at least, acute to obtuse at apex, barely longer than 1 mm., concavo-convex; anther disk yellow, apparently with about one half a dozen of hexagonal cells; female flowers 0.75 mm. long, the fertile ones with an expanded or disk-like blackisk brown pitted top while the greater part is light brown and stipitate, surrounded by many sterile flowers or paraphyses equally as long and fusiform at the middle, the base stipitate, the apex brown and extended into a brownish style.

Type specimen number 7197, *A. D. E. Elmer*, Palo, Leyte, January, 1906.

Collected in loose soil covered with dry foliage in the hill forest. Very rare!

This is a much smaller plant than *B. micrantha Warb.* and its subglobose heads at once distinguish it from heads clavately thickened.

Balanophora incarnata Elm. n. sp.

Distinctly dioecious and forming rather dense clumps 14 to 24 cm. across; rhizome simple or more often roundly lobed or branched, yellowish or isabellinus, warty and minutely lighter yellow pustulate; the individual ones rugose, varying from 1.5 to 3 or more cm. thick, irregularly opening at the orifice; stem few to several in a colony, of all stages, from a few cm. to 1 dm. high including the spike, glabrous, 5 to 7.5 mm. thick, bracteate from the base, red; bracts ruber, limp; turning brown, also glabrous, divaricately spreading and usually folded upon the ventral side, the lower or larger ones 3 cm. long, broadly oblong, apex obtuse to rounded. Staminate spikes more elongated and usually somewhat curved, upon a rather thick receptacle; staminate cluster 7.5 mm. long, subtended by a 3 mm. deep angular cupular persistent bract, short stipitate; the 4 perianth segments in the bud state curving over and forming a plated surface, ultimately widely spreading, of two slightly unequal pairs, thickly coriaceous, obcuneate, nearly 4 mm. long; anther cells light yellow, in an obovoid or nearly ellipsoid mass, numerous, arranged vertically; female heads finely tuberculate, carnosus, ellipsoid, the larger ones 4 cm. long and one half as wide; fertile flowers barely more than 1 mm. long, clavate, surrounded by numerous sterile ones or filiform paraphyses almost as long.

Type specimen number 10870, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Discovered in moist humus covered soil of dense forests at 3500 feet of mount Calelan. More recently I collected it again on a very steep forested slope among rocky outcroppings at about the same elevation in northern Agusan province. In the latter place it was quite common, apparently in colonies. The individual clusters are of all sizes, from a few inches to a foot or more across, forming circular masses and their color appealing to the eye as readily as a bunch of red flowers. It is a distinctly alpine *Balanophora*. "Kabo-kad-kad-tana" in Bagabo and "Magodaya" in Manobo.

Possibly nearest related to *B. forbesii Fawc.*

LEAFLETS OF PHILIPPINE BOTANY

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PHILIPPINE ILEX

by

A. D. E. Elmer

Ilex fletcheri Merr.

Mount Halcon and from the mountains of middle northern Luzon. Critically related to *I. hanceana Maxim.* and may prove identical.

Ilex foxworthyi Merr.

Practically known only from mount Banahao. Closely related to *I. halconensis Merr.*

Ilex guerreroii Merr. ms.

Collected by *Comm. L. Guerrero* in the mountains of San Mateo, province of Rizal, Luzon.

Ilex halconensis Merr. *Embelia halconensis Merr.*

The type is from mount Halcon, but it has also come in from Camiguin de Misamis.

Ilex microthyrsa Loes. ms.

Two specimens, one from Zambales province of Luzon and the other from mount Malindang of Mindanao.

Ilex palawanica Loes. ms.

Only known from *Dr. Foxworthy's* collection made on mount Pulgar of Palawan.

Ilex subcaudata Merr. ms.

So far only one specimen is known from the mountains of San Mateo, Rizal province, Luzon.

Ilex crenata luzonica (Rolfe) Loes. *Ilex luzonica Rolfe, Eurya myrtilloides Elm.* and *E. japonica parvifolia Vid.*

Quite common in the alpine forests throughout the Philippines.

Ilex cymosa Blm. *Ilex philippinensis Rolfe.*

More or less common in the hill forests or in the light woods of the coastal plains all over the islands.

Ilex cymosa cumingiana (Rolfe) Loes. *Ilex cumingiana Rolfe.*

Less common than the species.

Ilex buergeri rolfei (Elm.) Loes. *Ilex rolfei Elm.*

Dr. Loesner determined this to be a mere variety of *I. buergeri Miq.* the most southern range of which is Formosa. It seems to be not uncommon in the mountains of northern Luzon.

Ilex gracilipes Merr.

Very common in the mountainous regions of northern middle Luzon, less common in the Visayan section, not known from the southern Philippines. It is very close to *I. asprella (H. & A.) Champ.*

Ilex racemifera Loes.

Founded upon *Warburg's* number 14640 collected in the woods at Davao, Mindanao.

Ilex pulogensis Merr.

From mount Pulog, northern Benguet province, Luzon. Very near to *I. hanceana Maxim.*

Ilex benguetensis Elm. n. sp.

A tall and rather slender tree, with a trunk 20 m. high and 4.5 dm. thick; wood quite hard, white; bark smoothish, greenish gray, numerously set with small whitish lenticels, twigs more or less roughened with leaf scars, subangular toward the tips. Leaves copious, alternatingly crowded, rigidly coriaceous or chartaceous, shining green at least on the upper side, curing brown, duller beneath in the dry state, recurved at the short obtuse to acute apex, margins entire, base obtuse or subcuneate, oblongish or the smaller ones broadly lanceolate; the larger ones 1 dm. long by 3 cm. wide across the middle, glabrous; midvein quite prominent beneath, shallowly grooved along the upper side; lateral neaves 5 to 8 on a side, divaricate, very coarsely anastomosing, reticulations also relatively coarse upon the nether side; petiole 1 cm. long, flattened and creased along the upper side, glabrous. Inflorescence clustered in the uppermost leaf axils, ascending, upon 1.5 cm. long spikes or subsessile; rachis yellowish, puberulent, ridged, flower bearing from the base, occasionally at the base short rebranched, bracteated at the base; pedicels solitary or in small groups or in terminal subumbellate clusters, subtended by rather broad persistent bracts, shape and vestiture as the rachis, varying up to 4 mm. long, calyx spreading, shallowly cup shaped, puberulent on the exterior toward the base, 2 mm. across, 1.5 mm. long or high; teeth broadly acute or obtuse, finely ciliate along the margins, usually 4 but often with an additional dwarfed one; corolla creamy white, imbricated in the ellipsoid bud, 3 mm. long, united below the middle or toward the base, glabrous; lobes mostly 4, elliptic, with at few longitudinal veins; filaments 4, inserted upon the corolla and alternating with its segments, subterete, subglabrous, 1 mm. long; anther 1.25 mm. long, ovately oblong from the side view, bilobed at base and basifixed, apex rounded or bluntly apiculate by the extension of its connective; ovary ovately ellipsoid, obscurely rugose, terminated by a bifid stigma.

Type specimen number 8522, *A. D. E. Elmer*, Baguio, Benguet Province, Luzon, March, 1907.

This stately *Ilex* was collected along the Ipit river at 4000 feet altitude. Only known from northern Luzon.

Dr. Loesner determined this for me as a new species, though it is critically related to *I. cinereae Champ.* and *I. formosana Maxim.* It was distributed under the latter name and as to our Philippine species it is nearest to *I. guerreroii Merr.*

Ilex antonii Elm. n. sp.

Gnarly and rigid tree, 7 m. high and with a 2 dm. thick stem; branches arising from the middle and ascending, the ultimate ones numerous, erect and forming dense bushes; twigs terete, gray, rigid and roughened by the leaf scars, their young tips finely puberulent; wood hard, old bark brownish. Leaves very numerous, ascending, flat, deep green and shining on the upper side, much paler and duller beneath, very rigidly coriaceous, alternate or frequently subopposite or even subverticellate, drying unequally brown, the entire margins well curved upon the nether side, cuneiform, 1.5 cm. long by 7 mm. wide above the middle, subsessile or with very short petioles, apex truncately rounded and distinctly emarginate; midvein conspicuous beneath, the 4 or 5 ascending lateral pairs of nerves plainly evident but tips nearly obsolete, reticulations obscure. Spikes few from the upper leaf axils, ascending, 1.5 cm. long or less, striate, glabrous or when young very minutely puberulent, usually solitary but occasionally 2 to 3-clustered, flower bearing mainly in the upper one half; pedicels from 2 to 4 mm. in length, thick, glabrous, subtended by an obtuse bract and occasionally with a pair of small lateral ones; calyx greenish white, campanulate, occasionally subtended by bracteoles 1.5 mm. long, glabrous except the obscurely puberulent margins, united below the middle, the 5 segments obtusely rounded; corolla white, united below the middle, 3.5 mm. long, glabrous except the puberulent margins; segments 5, broadly oblong, rounded at apex, rotately spreading; stamens also 5, alternating with the segments and inserted upon the throat of the corolla; filament whitish, subcompressed, 1 mm. long, glabrous, inwardly curved; anther yellow, subbasifixed, broadly elliptic, bifid at base, emarginate at apex, 0.75 mm. long; ovary subglabrous, ellipsoid, tapering into the bifid stigma.

Type specimen number 11348, *A. D. E. Elmer,* Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in the elfinwoods of mount Calelan at 8000 feet altitude. The Bagobos call it "Masaleksik." Named after *Anton D. Elmer,* our son.

Its affinity is distinctly with *I. microthyrsa Loes.* but our leaves are more tapering at base, relatively much narrower and with lateral nerves not at all obscure.

Ilex apoensis Elm. n. sp.

A suberect and stocky tree; trunk 8 or more m. high, 6 dm. thick; main branches from below the middle, ultimately widely spreading, numerously rebranched and forming dense masses; old twigs crooked and gnarly, the young portion greenish but upon drying becoming nearly black, densely covered with raised brown lenticels; wood rather soft, delicately white, odorless and tasteless, covered with yellowish gray bark. Leaves glabrous, copious, ascending, broadly fusiform, slightly more acute at apex than at base, entire, 2.5 to 4.5 cm. long, 1.25 to 2 cm. wide across the middle or their widest portion, coriaceous, dark above, much paler beneath, drying unequally blackish brown; petiole black and glabrous, only a few mm. long; midvein appearing edged beneath and grooved above; the lateral nerves obscure, on an average about 5 on each side of the larger blades, their tips faintly united, reticulations obscure and relatively coarse. Inflorescence very profuse; stalks usually solitary but from all the leaf axils, greenish white, ascending, glabrous, 3 to 5 cm. long, striate, subtended by the base by short, thick and glabrous bracts, flower bearing from the base; pedicels divaricate, slender, the longer ones 4 mm. long, also glabrous, subtended by short and blunt bracts, usually solitary but occasionally in small groups; calyx 1.5 mm. long, glabrous, the 4 or occasionally 5 subrotund lobes with subhyaline finely ciliate margins, united around the base, pulverulent on the outside; petals 5, cremeus, glabrous, globose in the bud state, in anthesis truncately oblong, 2.25 mm. long, 1 mm. less in width, becoming nearly free; stamens as many as corolla segments, alternating with them; filaments glabrous, short and relatively thick, inserted upon the corolla near the base; anther basifixed, broadly ellipsoid, 0.75 mm. long, usually one anther cell sterile or having shed its pollen; ovary subglabrous, ellipsoid or well bulged at the middle, tapering to the subentire stigma. Fruiting spikes ascending, the rachis yellowish green; fruits globose, dark purplish red when ripe, juicy and bitter, 4 mm. in diameter, subtended by the persistent calyx.

Type specimen numbers 11449 in flower and 11408 in fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Gathered upon the upper forested region of mount Apo at 7000 feet altitude. My native Bagobo companion called the former number "Pagat-pat" and the latter "Marintok."

In *I. pulogensis Merr.* the rachis is short and thick, with fruits upon relatively short pedicels; our leaves have scattering black gland spots on the under side.

Ilex epiphytica Elm. n. sp.

Epiphytic shrub; stem few to several, ascending, 5 to 8 cm. thick, 4 m. high, repeatedly branched; twigs erect or suberect, green, drying blackish, glabrous, terete, relatively long. Leaves ascending, thickly coriaceous, conduplicate and strongly recurved at the abruptly acuminate apex, paler green beneath, glabrous, unequally brown when dry, very lucid above even in the dry state, alternatingly scattered, broadly rounded at the base, the entire margins subinvolute, subrotund or ovately elliptic, the blades 7 to 13 cm. long and grooved above; lateral nerves 9 to 12 pairs, ascending, reticulately united by their tips, reticulations quite numerous and plainly evident from both sides; petiole 1.5 cm. long or less, glabrous, blackish brown on the dry specimens. Infrutescent spikes suberect, axillary or lateral, 2.5 cm. long or more frequently much less in length, solitary, apparently subtended by small bracts, fruit bearing from the base, fluted, glabrous but in flowering condition finely puberulent; pedicels 3 mm. long, subtended by bracteoles, divaricate or deflexed; fruits hard and green, in the dry state brown, subtended by the 5 or 6 roundish calyx segments, 3-seeded.

Type specimen number 13718, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Upon moss and vine covered large limbs of massive trees in a forested depression at 3500 feet altitude between Duros and Cawilanan peaks. "Catagyo" or "Catagdo" in Manobo.

Retated to *I. foxworthyi Merr.*

LEAFLETS OF PHILIPPINE BOTANY

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A FEW NEW POLYGALACEAE

by

A. D. E. Elmer

SECURIDACA Linn.

Securidaca atro-violacea Elm. n. sp.

A scandent woody climber; stem terete in outline, 5 cm. thick, flexible, branched occasionally toward the top, crooked and twining; bark rough, brown with gray blotches; wood soft, dingy, white, odorless, bitterish, the cordage divisions well divided by the bark; branches long, terete, tough, dark green and very smooth, freely rebranched, drooping over the river bed, glabrous and drying brown. Leaves flat, coriaceous, pendant, lighter green beneath, greenish brown in the dry state, ovately oblong or elliptic, the entire margins involute, apex broadly rounded and usually emarginate, broadly obtuse or rounded at the base, the average blades 5.5 cm. long and 2.75 cm. wide across the middle or just below it, frequently much smaller, well scattered alternatingly along the branchlets; midvein conspicuous beneath, shining and lighter yellow at least in the dry leaves; lateral nerves obscure, ascending, with 6 main pairs and frequent intervening secondary ones, their tips reticulately united, more evident from the upper side; petiole glabrous, slender, 6 mm. long. Inflorescence 5 to 8 cm. long, mostly from the terminal leaf axils, 2 to 3-forked from below the middle or from near the base, the peduncle proper glabrous, the forks flower bearing their entire lengths; flowers odorless, between levidus and atro violaceus, early falling and leaving conspicuous scars along the yellowish brown puberulent rachis; slender pedicels glabrous, flower colored, divaricate, subtended by small caducous similarly puberulent bracts; bud ovoid; calyx 3.5 mm. long, the 3 segments more or less united about the base, elliptic or ovately so, rounded at apex, veiny, concavo-convex, glabrous or finely ciliate at least along the margins; inner 2 sepals large, erect, 7.5 mm. long, one or two mm. narrower, truncately narrowed toward the narrow base, ovately rotund in outline, strongly and numerously veined; the upper 2 petals 5 mm. long, imbricate, truncate and occasionally lobulate or notched at the distal deep yellow portion, hyaline below the middle, veins arising from the base, extending through the middle portion and widely spreading in the terminal portion; the third petal 8 mm. long and nearly 6 mm. wide across the top, abruptly constricted and thickened below the middle, the upper one half subrotund in outline, obscurely 3-lobulate, hyaline, delicately veiny, the terminal membranous lobe very much ruffled and subentire; the lateral lobes or petals very short or only very few mm. long, oblong, usually attached on the basal exterior portion of the largest segments; stamens 8, in 4 pairs, attached to the corolla segments a trifle below; filaments 6 mm. long, glabrous, adnate, only the subhyaline terminal portion free; anther 1 mm. long, oblong, short apiculate, basifixed; pistil 5 mm. long; style very much bent or curved, thick, glabrous, at the basal portion bearing a membranous fold, 0.5 mm. thick, pulverulent toward the flattened darker colored stigma. Fruit rugosely compressed, oblique, 1.75 cm. long, 0.75 cm. wide, its upper edge extended into a 3.5 cm. long by 1.5 cm. wide brown colored wing which is usually a trifle wider just a little above the middle.

Type specimen numbers 12774 in flower and 13238 in fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and May respectively, 1911.

Discovered this beautiful species in thickets of woods along a steep and more or less stony red soil of the Iwaling river at 750 feet altitude; the fruiting specimen was collected upon seepage ledges of the same river at a higher altitude.

XANTHOPHYLLUM Roxb.

Xanthophyllum palawanensis Elm. n. sp.

Erect shrub or becoming tree-like; stem 10 cm. thick, 3 to 5 m. high, terete, branched from below the middle; wood moderately soft, whitish, odorless, tasteless or only slightly bitter; bark smoothish, green beneath the yellowish gray epidermis; main branches ascending, rather long, repeatedly branched, greenish gray except the yellowish excrescences; twigs horizontal or descending, dull green, finely puberulent, drying reddish brown, leaves suboppositely scattered along the branchlets or alternate, pendant, subchartaceous, pleasing green above, yellowish so beneath, glabrous, shallowly curved upon the upper surface, diverse in size, entire, drying greenish brown, ovately elongated or oblongish, base broadly rounded and auriculately cordate, 8 to 13 cm. wide below the middle, 2 to 3 dm. long, gradually tapering to the acute point; midvein stout on both sides especially beneath, glabrous; the 9 to 12 main nerves slightly ascending and curved, their ends forming a submarginal line 5 mm. from the edge, secondary ones intervening and extending from the midvein to one half the distance to the margin and coarsely reticulated with the main nerves, reticulations conspicuous beneath and numerous; petiole 3.5 mm. thick in the dull brown wrinkled dry state, subglabrous, 1 to 1.75 cm. long, usually with a rigid pair of ovately elongated bud bract in its axils. Inflorescence terminal, few paniculately branched from near the base, 1.5 dm. long, melleus puberulent or velutinous, the short peduncle subtended by a series of unequal deciduous puberulent 5 to 8 mm. long elongated bracts; flowers alternatingly scattered along the spike-like and ascendingly curved and very angular branchlets; pedicels 2 mm. long, one half as thick, puberulent, subtended by a caducous bract which is longer than the pedicel itself, leaving large scars after falling; calyx glabrous, broadly cup shaped, imbricate, the 5 segments united at their thick bases, ovately rotund, 5 mm. long, the outer ones considerably thicker; corolla bud strongly imbricate, conically elongated, flesh red, also glabrous, coriaceous; the 5 petals spreading in anthesis, 1.5 cm. long, subequal, the sides usually rolled upon the ventral surface, constricted below the middle and short clawed at the base, incarnatus, oblongish or elongated especially above the middle, obtusely rounded at apex, apparently the lower segment much broader above the middle, distinctly clawed below it and a trifle shorter; stamens usually 8; filaments 1 cm. long, somewhat flattened, fleshly, thickened and puberulent 3 mm. from the base, otherwise glabrous, slightly curved toward the apex, freely inserted upon the base of the corolla segments; anthers 1.5 mm. long, oblong, basifixed, with a tuft of hairs at the basal dorsal portion; pistil 1 cm. long, strigosely pubescent, the ovary rugose and gradually extended into the thick terete style which gradually tapers to the subglabrous rather small stigmatic point. Inflorescence upon slenderly elongated paniculate branches; pedicel 5 mm. long, very thick and rim-like at the distal end, pale fulvus tomentose; fruit globose, in the younger state similarly pubescent, 1.5 cm. in diameter, apparently 1-seeded.

Type specimen numbers 12931 in flower and 13170 in fruit, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, April and May, 1911.

Discovered the flowering number in shrubberies among cogonals; the fruiting specimen in secondary forests, at about 500 feet altitude along the trial to Napsan.

As to our Philippine material it is only distantly related to *X. macranthum Chod.* based upon specimen from the lake Lanao region of central Mindanao. Also related to *X. vitellinum Blm.*

Xanthophyllum floriferum Elm. n. sp.

Large tree; trunk 7.5 dm. thick, toward 20 m. high, terete, straight, chiefly branched at the top; wood quite hard, odorless and tasteless, melleus throughout; bark similarly colored beneath the smooth grayish white epidermis; main branches crooked, ultimately numerously rebranched; the twigs lax, rather slender, ascendingly curved, terete, drying olivaceous, only the young portion finely puberulent. Leaves descending, coriaceous, folded upon the upper much darker green surface, glabrous, well scattered along the branchlets and alternating, brownish above and green beneath when dry, apex gradually acuminate and frequently somewhat curved or subfalcate, base obtuse or acute, margins entire but more or less rugose or undulate, broadly lanceolate to lanceolately oblong, the larger blades 1 dm. long by 3.5 cm. wide across the middle or below it, frequently smaller, usually with a pair of elongated glands at the base beneath; midvein yellow and prominent beneath, flat above, subglabrous; lateral nerves 5 to 7 on each side, very oblique and only slightly curved, their tips submarginally extending, conspicuous beneath, less so on the upper surface, reticulations numerous and very evident especially on the nether side; petiole 1 to 1.5 cm. long, glabrous or subglabrous, caniculate. Panicle yellowish green, ascending, terminal or from the uppermost leaf axils, less than 1 dm. long, branched from near the base, the widely spreading or recurved branches finely tomentose or becoming glabrous, the peduncle stout and only 1 to 2 cm. long, the main or lowermost branchlets usually opposite, the others alternating, flower bearing from below the middle and crowded at the distal end; flowers profuse, divaricate, creamy white but with age turning luteus, odorless, irregular; pedicels 3 mm. long, recurved, subtended by deciduous rather acute bracts, greenish puberulent; calyx pale green, imbricate in the pointed bud state, subequal, ranging from 3 to 5 mm. in length, ovate to elliptic, united at the base, spreading in anthesis, subpersistent, the sides usually involute, erect and with a rather broad truncate thickened basal shoulder; petals creamy white when fresh and luteus when old, 7 mm. long, 5, the basal one half erect and conduplicate, one of them quite dissimilar in shape, being obovoid toward apex and clawed toward the base, while the others are oblongish for their whole lengths, sides likewise involute; stamens 5, alternating with the petals and inserted upon them toward the base; filaments much flattened toward the adnate base, glabrous, 6 mm. long, upwardly curved toward the apex; anthers oblong, 0.75 mm. long, subdorsifixed, sparsely bearded at the lower end; ovary superior, upon a short thick stipe, surrounded by a leathery rim-like appendage, glabrous; style fleshy, densely hairy except the apical portion, a trifle shorter than the filaments, bearing a slightly enlarged stigma

Type specimen number 12871, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This large tree with a fine bole was discovered in moist ground of dense forests at 750 feet altitude on the trail to Napsan.

Distinguished from *X. glandulosum Merr.* by its smaller leaves whose blades are always widest toward the base rather than across the middle and whose pedicels are twice as long; our flowers are also shorter stalked and less cinereous pubescent.

Xanthophyllum multiramosum Elm. n. sp.

A hardwood tree, 10 m. high or higher, branched from below the middle; main branches rather long, terete branchlets numerous; the glabrous ultimate ones relatively short, dark brown when dry. Leaves many, alternate, scattered along the twigs, mainly horizontally spreading, coriaceous or subchartaceous, the larger ones 7 cm. long without the petiole, 3 cm. wide at the widest portion or across the middle, frequently smaller, the acuminate apex recurved, base acute or subcuneate or subobtuse in the larger leaves, entire, glabrous, drying lighter brown beneath, sublucid, oblongish or subelliptic with sharp ends, the smallest leaves broadly lanceolate; midvein yellowish brown and glabrous, without basal glands, the 3 to 5 lateral nerves ascending and their tips strongly curved, the minute reticulations quite evident from beneath but obscure above; petiole 5 mm. long, of the same color as the twigs, caniculate. Infrutescence axillary, the thick stalks about 1 cm. long, usually bearing few subsessile fruits at the distal end; fruit hard, deep green, glabrous, subglobose, 1.25 cm. in diameter, usually only with one seed.

Type specimen number 8701, *A. D. E. Elmer*, Baguio, Province of Benguet, Luzon, March, 1907.

Collected in a deep cut or ravine between the city of Baguio and Trinidad valley. The Igorotes call it "Bultig" and the wood is used in making native harrows.

Xanthophyllum subglobosum Elm. n. sp.

Tree, 15 m. high, 6 dm. thick at least; bark mottled, finely lenticelled; wood moderately hard, white throughout; main branches spreading, rebranched; twigs terete, tough, quite numerous and relatively short, covered with grayish brown bark, even the young parts glabrous. Leaves copious, alternate, subchartaceous, slightly darker green above, glabrous, the obtuse to acute apex somewhat recurved, base broadly obtuse or rounded, eglandular at the base, drying light green beneath, the average blades 7.5 cm. long by 3.5 cm. wide at the middle, entire, elliptic or elliptically oblong; midvein quite conspicuous from beneath, the 7 to 9 lateral pairs ascending and their tips much curved along the margin, equally visible from both sides, the minute reticulations quite evident; petiole grooved, at least 5 mm. long, glabrous. Flowers few clustered at the distal end of the short and stout glabrous peduncle, about as long as the petioles, light cremeus, easily falling; pedicel glabrous, brown, 3 mm. long, subtended at the base by 3 blunt greenish bracts; calyx proper of 3 subrotund and 1.5 mm. long sepals; the inner segments of petals about 5, broadly elliptic, 2 mm. long; ovary much flattened, 1.5 mm. across; stamens subsessile or upon very short filaments, attached between the ovary and the basal portion of the inner segments; anthers very broad and well parted at the basifixed base, short ovoid. Fruits hard, subglobose and occasionally rugosely globose, sessile, in the dry state somewhat flattened, smooth, apex deeply indented, 2 cm. across.

Type specimen number 9470, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Oriental, Negros, March, 1908.

Collected in deep wooded ravines along Bonyao river at 1500 feet altitude. The local Visayan called it "Bunlas."

This is evidently not *X. multiramosum Elm.*, neither can it be referred to *X. affine macrocarpum Chod.* Our leaves are much thinner and fruits smaller and subglobose. Number 10380 from this same locality I distribute under *Chodot's* new variety.

Xanthophyllum subglobosum longifolium Elm. n. var.

Small tree and suberect; stem subterete, 15 cm. thick, 7 m. high, branched toward the top only; wood rather hard, yellowish, quite odorless and without taste; bark smooth and greenish gray blotched, yellowish otherwise; main branches spreading and crookedly rebranched, the rather rigid twigs horizontally spreading, terete and glabrous. Leaves glabrous, not numerous, alternate, similarly spreading, curved upon the upper side, chartaceous, duller green above, curing green, margins entire, apex acute or subacuminate, base obtusely rounded, blades 15 cm. long and at the middle 4.5 cm. wide, oblong; midvein bold beneath, also glabrous and green in the dry state; lateral nerves 5 to 7 or with a few alternating ones intervening, strongly curved, much less conspicuous, reticulations equally visible from both sides; petiole 5 mm. long, relatively thick, glabrous, with a broad groove oblong the upper surface. Inflorescence ascending, axillary; flowers clustered at the distal end of the 5 to 15 mm. long subligneous peduncles, caducous; pedicel yellowish green, glabrous, 2 mm. long, subtended at the base by a similarly colored rim-like bract, with 1 to 3 obscure brown margined lobes; buds cremeus, globose; perianth of 2 series, the outer 3 rotund and 3 mm. across, the inner series nearly twice as long and as numerous and broadly elliptic; ovary very pale yellow, flattish globose, 1.5 mm. across; style very short, bearing an obscurely lobed stigma; stamens 5, inserted upon the inner basal portion of the segments; filaments white, 1 mm. long, relatively wide at the base; anther basifixed, ovate, shorter than the filament, the two cells widely separated at the base. Fruit hanging, hard, solid, ovoidly flattened, green but when mature sulphureus, sessile.

Type specimen number 13937, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered on a dry forested ridge at 3500 feet altitude of Duros peak. The Manobos call it "Malagsac."

The membranous leaves coupled with the subglobose fruits usually with a sunken apex at once place it with *X. subglobosum Elm.*, but the leaves in our variety are elongated.

LEAFLETS OF PHILIPPINE BOTANY

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SOME FERNS OF NORTH-EASTERN MINDANAO

by

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The collection made in 1912 by *Mr. Elmer*, in the mountains east of the mouth of the Agusan river, contains a large number of ferns believed to be very rare, since they are collected for the second or third time only. The number of new species is strikingly small, compared with *Mr. Elmer's* previous collections or with others made in territory equally new to botanists. This marked falling off in the number of new species indicates that the bonanza period in Philippine pteridology is past, a fact attested by the study of other recent collections as well. I recently climbed a virgin peak almost three thousand meters high in northern Luzon, without finding a single new fern.

Only such ferns as are new or suggest comment of probable interest find mention in the following.

Angiopteris Elmeriana n. sp.

Trunco 60 cm. crasso et alto; stipite teste *Eimer* 2 m. alto, 5—8 cm. crasso, deorsum paleis latericiis vestito; fronde usque ad 3 m. alta, ponderosa; pinnis usque ad 80 cm. vel ultra longis; pinnulis ca. 15 cm. longis, 15—17 mm. latis, sessilibus vel brevipedicellatis, basi plus minus inaequilateraliter truncatis, apice sensim in caudam inconspicue sed acute ser-

rulatam angustatis, margine alibi integra et acuta, infra ad costam et rarius ad laminam squamulis sparsis laceris brunneis valde caudatis adspersis, supra atroviridibus infra pallidis, subcoriaceis (siccis); venis spuriis inconspicuis, opacis; soris ca. 1 mm. a margine distantibus; indusio solummoda post abscissionem sori possibili visu, pilis et squamulis ibidem carentibus; sporangiis plerumque 9—11; sporis albidis. Differt ab:—

A. ankolana de Vr., acumine subintegra, venis opacis.

A. microsporangia de Vr., pilis circum receptaculum carentibus.

A. evecta Hoffm., apice integriore, soris paleis haud circumdatis.

Between Duros and Cawilanan peaks, alt. 1050 m., No. 13736.

Cyathea integra J. Sm. No. 13473, Pk. Duros, alt. 800 m.

A remarkably ample form; pinnules up to 13 cm. long and 3.5 cm. wide, stalked, cordate, with acute segments.

C. integra is decidedly variable, and not usually quite entire. I regard *C. hypocrateriformis v. A. v. R.* as merely a form with distinctly serrate segments, connected with the typical form by intermediates in our collections.

Cyathea (Alsophila) Warihon n. sp.

Caudice 2—3 m. alto, 3—5 cm. crasso; stipite teste *Elmer* ad basin ca. 12 mm. crasso, paleis pallide castaneis vestito; fronde 90—150 cm. longa, patente, deorsum angustata et pinnis ibidem vix 12 mm. (*Elmer*) longis; rhachi inerme, castanea, infra glabrescente, nitida; pinnis fere sessilibus, usque ad 35 cm. longis et 12 cm. latis, acuminatis, rhachibus squamulis concoloribus minutis bullatis, et aliis sparsis deciduis linearibus usque ad 2 mm. longis, vestitis; pinnulis plerumque sessilibus, lanceolatis, acutis, deorsum pinnatis; pinnulis^{II}, resp. segmentis, adnatis, ca. 8 mm. longis, 2—2.5 mm. latis, rectis vel subfalcatis, obtusis, integris crenulatis vel obscure serrulatis, papyraceis, infra pallidis, lamina glabris; costa pinnulae paleis parvis bullatis ovatis praecipue deorsum vestita, costa segmenti eisdem adsparsa; venulis utroque latere ca. 8, inferioribus furcatis vel bis furcatis; soris costularibus, parvis, nudis, palea parva saepe subtensis.

In gulches above lake Donao, alt. 1550 m., No. 13823.

Somewhat similar to *C. lanaensis Copel.* and *C. junghuhniana (Kze.) Copel.*, but different from both in details of pubescence as well as in the naked sori.

Cyathea (Alsophila) dimorphotricha n. sp.

Caudice ca. 5 m. alto, 7.5 cm. crasso, sursum cicatricibus oblongis ornato; stipite ca. 30 cm. longo, 2.5 cm. crasso, inferne brunneo et pilis vel paleis latericiis dense vestito; fronde 2 m. longa (teste *Elmer*); rhachi fulva, molle vel minute asperula, mox glabra nisi in furca superiore; pinnis 40—45 cm. longis, sat abrupte acuminatis, brevi- (1 cm.) stipitatis, rhachi superne pilosa, inferne glabrescente; pinnulis horizontalibus, subsessilibus, usque ad 9 cm. longis, ca. 15 mm. latis, acuminatis, vix pinnatis, costa inferne pilis paleisque caudatis fimbriatis vestita; segmentis infimis ala angusta hyalina connexis, 3 mm. latis, apice rotundatis, serrulatis, papyraceis, superne laete viridibus, inferne quemadmodum pallidioribus, costula inferne pilis et sparsius paleis ovatis bullatis abrupte in caudam fimbriatam productis vestita, pubescentia ubique nisi in caudam interdum rubram palearum pallida; venulis utroque latere ca. 10, supremis simplicibus, aliis furcatis, interdum bis furcatis; soris costularibus, nudis vel pilis paucis subtensis.

Cawilanan peak, alt. 1400 m., No. 13846, type; Cabadbaran, definite locality not stated, No. 14254.

Near *C. Raciborskii Copel.* (*Hemitelia crenulata Mett.*), the Javan specimens of which have, however, distinctly different pubescence.

Cyathea cinerea n. sp.

Caudice 12 cm. crasso, fere 5 m. alto, ob baseos stipitum spinoso, deorsum radicibus obtecto; stipite 2.5 cm. crasso, tereto supra applanato, spinis 8 mm. longis acutis nigris vel subnigris munito; fronde ultra 2 m. longa, recurva (teste *Elmer*); rhachi valida, spinosa, fulva, minute fur-

furacea vel deinde glabrescente, sub pinna quaque glandulifera; pinnis 40—50 cm. longis, brevi-stipitatis, abrupte acuminatis, rhachi minute aculeata, pallida et ob squamulas minutas cinerea, paleis angustis paucis adspersa; pinnulis subsessilibus, lanceolatis, acuminatis, fere ad costam pinnatifidis, sterilibus usque ad 10 cm. longis, 18 mm. latis, fertilibus paullo minoribus, costa superne sparse velutina, inferne deorsum squamulis minutes et paleis paucis ovatis pallidis vestita; segmentis 10 mm. longis, 2.5 mm. latis, subfalcatis, acutis, sursum serratis, papyraceis, costis sparse pallide paleaceis; venulis utroque latere ca. 12, plerisque furcatis; soris costularibus, magnis, confertis; indusio amplo, laete brunneo, in segmenta magna persistentia fisso.

Between the peaks of Duros and Cawilanan, alt. 1050 m., No. 13860.

Probably as near to *C. mitrata Copel.* as to any species.

Elmer states that there are "No scales on the stipes or stipe bases along the trunk, only the young bud covered with relative castaneous scales"?

Dryopteris viscosa (J. Sm.) O. K. No. 13555.

In spite of its free veinlets, this is unmistakably a near relative of *Mesochlaena polycarpa (Bl.) Bedd.* The pubescence is in this case a better group character than the anastomosis of the veinlets.

Dryopteris urdanetensis n. sp.

Rhizomate breve, repente, 1—2 mm. crasso; stipitibus confertis, 3—10 cm. altis, rhachique pilis retrorso-incurvis 0.2—0.4 mm. longis pallidis dense vestitis; fronde lineari-lanceolata, acuminata, 8—15 cm. longa, deorsum pinnata, supra mediam pinnatifida; segmentis ca. 3 mm. latis, oblongis, apice rotundatis, margine revolutis, papyraceis, ubique minute pilosis, inferne minute glandulosis; pinnis infimis plerumque remotis et diminutes, brevi-stipitatis, medialibus lobato-dentatis, sessilibus, superioribus adnatis; venis in pinnis et segmentis infimis farcatis et liberis, alibi plerumque simplicibus, venulis infimis segmentorum adjacentium saepe anastomosantibus; soris medialibus, indusio hirsuto.

Between the Masay peaks or the summit peaks of mount Urdaneta, alt. 1800 m., No. 13762.

Probably near *D. sessilipinna Copel.*, P. J. S. VI C (1911) 145, as indicated by the pubescence; but a very distinct species.

Athyrium propinquum n. sp.

Species *A. pinnato* (*Blanco*) *Copel.* affinis, quo pinnis fere linearibus et fronde sursum valde attenuata distinguitur; fronde 40 cm. alta, longe caudata, infra apicem bulbifera; pinnis stipitatis, 9 cm. longis, 13 mm. latis, subfalcatis, acutis, serratis.

Mt. Urdaneta, alt. 1050 m., No. 13935. Called Catco by the Manobos.

Athyrium pinnatum as I construe it is so very variable a species and includes so many forms which have been given names as species, that I do not like to propose another name in the group; but this plant stands so clearly without the range of continuous variation as shown in our collections that this seems still to be the most reasonable way to treat it.

Asplenium griseum Copel. No. 13599, alt. 450 m., Manobo name Dapog.

Known only in Mindanao. The terminal leaflet and the one next below it are very close together and almost of the same size, giving the frond a peculiar appearance of truncateness.

Davallodes gymnocarpum Copel. No. 14243, Camiguin island, Misamis province.

Elmer's plants show no trace of an indusium, but a recent collection by *Ramos*, from the same small island, bears indusia which can be detected. This seems to be another species, and in a new group, which may not develop this structure.

Adiantum scabripes Copel. P. J. S. VII C (1912) 55.

This is the second collection of this beautiful fern, found first by *Mr. Weber* in the same vicinity. The indusia of some fronds are nearly 1.5 mm. wide.

Pteris opaca J. Sm.

After studying *Elmer's* plants, I doubt the distinctness of *P. Taenitis Copel.*, described from the same region.

Polypodium stenophyllum Bl. No. 14146, alt. 1350 m., Manobo name Notong-notong.

Remarkably large and acute fronds. In view of *Blume's* expression "Frondibus . . . . . . obtusis," it seems to me that *Christ's* variety *obtusum* should rather be regarded as the typical form.

Polypodium halconense Copel. No. 13761, alt. 1800. m.

The second collection of this interesting fern. It is a connecting link between the *P. tenuisectum* group and the body of the genus.

Elaphoglossum Elmeri Copel. No. 13746, alt. 1400 m., Manobo name Dohus-dohus.

The only previous collection is *Elmer's* from Mt. Calelan. The new specimens have larger fronds, but are otherwise identical.

LEAFLETS OF PHILIPPINE BOTANY

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PALAWAN ACANTHACEAE

by

A. D. E. Elmer

JUSTICIA Houst.

Justicia gendarussa Linn.

Field note:—Suberect shrub, in sand gravelly soil along wooded banks of a river at 500 feet altitude; stem terete, 1 inch thick, 6 feet high, crooked, branched from near the base; wood quite hard, white, odorless and tasteless; bark smooth, grayish white; branches numerous, laxly rebranched, green and conspicuously nodo e, suberect; leaves flat, ascending or horizontal, thinly coriaceous, much lighter green beneath; bracts with calyx green; corolla ascending and pale violaceus and purplish spotted in the throat.

Represented by number 12811, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

THUNBERGIA Retz.

Thunbergia fragrans Roxb.

Field-note:—A twining perennial vine, upon shrubberies along a thicketed stream bank of low compact black soil near the Balsahan river at 50 feet altitude; stem branched, hispidulous, dark green, quadrangular and more or less twisting; leaves ascending, similarly rough, subchartaceous, flat or shallowly folded upon the upper side, tips recurved, much paler green beneath; flowers solitary from the leaf axils, erect, the angular pedicels and two bracts green; calyx very pale green; corolla pure white, constricted at both ends of the tube, curved and flattened across or in the middle region, the 5 rotately spreading segments imbricately twisted to the left in the bud state; style also whitish, stigma green; fruits upon obscurely 4-lobed flattened capsule with a prominently compressed and rigid back, dull green, 4-celled and normally with 4 round blackish seeds; flowers entirely odorless.

Represented by number 13076, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

PSEUDERANTHEMUM Radlk.

Pseuderanthemum bicolor (Schr.) Radlk.

Field-note:—An erect suffrutescent usually a 3 feet high undershrub; stem subterete, with longitudinally striae, smooth, brown when young, yellowish when old, 0.3 inch thick, the soft greenish wood with a comparatively thick white pith, very sparingly rebranched from the middle, the branchlets erect; leaves mostly or always at the top, in 3 spreading pairs, horizontal, subcoriaceous, much paler beneath; calyx green, corolla erect, early falling, white except the deep purplish brown blotch on the upper side of the leaf segments toward or the middle basal portion; young fruits green, 1 inch long, flattened and expanded above the middle. Quite pretty and showy, commonly scattered through the fertile damp woods at sea level. "Boyan" is the native or Tagbanua name.

Represented by number 12628, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Possibly it should be referred under *Eranthemum Linn.*

STROBILANTHUS Blm.

Strobilanthus palawanensis Elm. n. sp.

A perennial herb, nearly 1 m. high; ultimate branchlets grooved along the sides and puberulent, ascending. Leaves opposite, the pairs very unequal, membranous, relatively whitish brown beneath when dry, elliptically oblong to ovately so or merely elliptic, the larger lamina 1 dm. long by 4.5 cm. wide at the middle or a trifle below it, gradually tapering toward the acute or acuminate apex, base subcuneate or obtusely rounded, entire at the base, otherwise obscurely dentate to shallowly crenate, the smaller leaves of the pairs less than one half as large, sparsely yellowish strigose especially on the upper side; the young leaves conduplicate and densely fulvus pubescent; midvein beneath dirty yellowish pubescent; the lateral nerves 6 to 7 pairs in the average blades, ascendingly curved, reticulations obscure; petiole 2.5 cm. long, olivaceus pubescent, strict, much shorter for the smaller leaves. Inflorescence in the terminal leaf axils, few flowered, subtended by a series or whorl of foliaceous bracts; the green bracts ascending, oblongish, the longer ones 2 cm. long, 5 to 8 mm. wide across the middle, yellowish brown ciliate pubescent on both sides, subentire toward the base and coarsely crenately toothed above the middle, soft membranous; flowers subtended by a pair of linear ascending bracts; bracts 7.5 mm. long by 1.5 mm. wide, obtuse at apex, more tapering toward the base, greener above the middle and more ciliate; hairs hyaline, distinctly jointed; sepals also erect, 4 to 5 mm. long, 1 mm. wide, rather lanceolately constricted toward the sparsely ciliate apex, falsely united at the base, 5 in number; corolla bud glabrous, ellipsoid, dark brown; corolla white and tinged with pink or purplish, nearly 2 cm. long, gradually expanded at the throat, tubular toward the base, a trifle hairy on the exterior at about the middle, the 5 lobes subrotund or elliptic; fertile stamens 4, inserted on the tube above the middle; the filaments unequal in length, glabrous, the longer pair 3 mm. long, the shorter ones one half as long; anther broadly oblong, 1.25 mm. long, bilobed at base, basifixed, the connective extended into a slender point in the young state; ovary glabrous, bearing a slender curved style and a small stigma.

Type specimen number 13249, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered in rich soil of dense forests at 750 feet altitude along the trail to Napsan. Very rare!

ERANTHEMUM Linn.

Eranthemum minutiflorum Elm. n. sp.

Erect and suffrutescent plants; stem unbranched, 3 to 12 dm. high but usually only 2 dm., tightly fastened to the ground by its long tough and numerously branched roots, thickest near the root crown, terete, crooked at the old joints, wood greenish and curved with minutely checked yellowish gray bark, the terminal young portion green and dirty yellowish puberulent. Leaves horizontally spreading, flat and only slightly recurved at the abruptly acuminate to caudate apex, coriaceous, much paler green beneath, opposite, only a few pairs toward the top, usually the basal pair larger, the larger blades 16 cm. long by 6 cm. wide across the middle or a trifle below it, most of them smaller, base obtuse or cuneate, entire, glabrous, drying similarly dull green on both sides; midvein very sparsely puberulent, the 4 to 6 lateral nerves ascendingly curved and tips very coarsely anastomosing, reticulations minute; petiole 1 to 2 cm. long, striate, finely pulverulent. Spikes erect, green, varying from 5 to 25 cm. in length, terete, finely brown pulverulent, usually 3 but often 2 or solitary, subtended at the base by a smaller pair of leaves, flower bearing from below the middle; flowers usually in small axillary groups of two to three, well scattered especially toward the base, short pedicelled; the pedicels more or less subtended by a pair or a whorl of lanceolate linear unequal slightly hispid paler green bracts varying from 1 to 3 mm. in length; calyx similarly in color, 3 to 4 mm. long, setaceously lanceolate, the basal one third united, hispidulous especially in the old state, 5-segmented, occasionally one or more are of smaller size; corolla about 1 mm. longer, tubular, constricted in the middle region, subinflated at the glabrous whitish base, the lobe bearing portion somewhat enlarged; lobes dingy lilac, subequal, normally 5, subrotund, the exterior side as well as the middle portion of the tube puberulent, imbricate in the bud, usually the inner ones smaller and subglabrous on the back, 1 mm. long and nearly as wide; stamens 2, fertile; filaments less than 1 mm. long, erect, glabrous, inserted upon the constricted portion of the corolla tube; anther cells attached at the apex, otherwise free and divaricate, a trifle oblique, basal ends obtuse, 0.75 mm. long, usually unequal; ovary ellipsoid, glabrous, 2 mm. long; style short and thick, slightly hairy toward the base; stigma slightly enlarged and oblique. Capsule deep green, 2 cm. long, angular, pulverulent, slenderly stipitate, dehiscing from the apex into 2 recurved carpels, apex rather stoutly and finely pointed, loculicidal, constricted between the upper and lower seed cavities, impressed along the sides; seeds 2 in each of the two cells, in the axils of the slenderly pointed retinaculae, lenticular, at least 3 mm. across, brown, corral-like marked, the basal portion notched and bluntly pointed on one side of it.

Type specimen number 13084, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This peculiar plant was discovered in gravelly or stony flats of secondary forests along the Balsahan river at 50 feet altitude.

DICLIPTERA Juss.

Dicliptera clarkei Elm. n. sp.

Suffrutescent perennials; stems 3 to 15 dm. high, 1 cm. thick for the ranker ones, dark green, smooth, terete, nodulose at the joints, occasionally branched from near the base but usually only short branched at the top; branchlets at least in the dry state constricted just above the joint, slender, subglabrous. Leaves diverse in size, flat, submembranous, a trifle paler beneath, light green when dry, the basal pairs larger, opposite, well scattered but only toward the end of the branchlets, the fine cystoliths seen from both sides, glabrous, entire, gradually acute to acuminate toward the recurved apex, base cuneate or obtuse, the larger lamina 12 by 5 cm., the majority of the upper ones smaller, oblongish to narrowly elliptic with extended ends or the smallest ones broadly lanceolate; midvein yellowish green, the 5 to 7 fine and ascendingly curved lateral nerves much less evident; petiole of the smaller leaves less than 1 cm. long, of the larger more than 3 cm. in length, fluted, subglabrous. Inflorescence axillary and lateral; peduncle solitary or in pairs, 3 to 5 mm. long, striate and finely ciliate along the edges, terminated usually by 3 flowers; pedicels unequal in length, the terminal or longest one longer than the peduncle, subtended by a pair of spinescent green divaricate bracts 4 mm. in length, finely ciliate or puberulent; floral bracts ovate or subelliptic, bright green, horizontal, flat, the ciliate marginal portion deeper green, terminated by a fine needle-like point, the upper or larger one of the pair 1 cm. long by 7 mm. in width, the smaller one about a fourth less in length, minutely reticulate, the upper portion finely strigose; flowers usually in pairs, enclosed by an equal pair of bracts, not of the same age, erect, subsessile, green, the setaceous pair of subtending bracts 2 mm. long, hyaline and finely ciliate margined; calyx segments sharply acuminate, lanceolate, 3.5 mm. long, subhyaline, puberulent or ciliate along the margins and toward the apex; corolla light pink or withish at the tubular base, expanded toward the deeply bilobed base, finely pubescent on the exterior except at the base, 1.5 cm. long, at least 5 mm. wide above the middle, the upper lip oblongish and obtuse at apex, the other narrower and more elongated; stamens 2, fertile, equalling the corolla lips; stamens inserted upon the corolla below the middle, ribbon-like, glabrous, 6 mm. long; anther cell introrse, 1 mm. long, compressed, one inserted almost upon the other; style very slender, glabrous, equalling the stamens, terminated by a 2-lobed divergent stigma, very brown, elongated, upon a rim-like rather thick pedicel, mucronate at apex. Capsule 7.5 mm. long, bluntly pointed at both ends, angular, smooth, creased along the suture, loculicidally dehiscent, 2-celled, 2-seeded; seeds reddish brown, compressed, squarrish except the stout basal point, prominently darker brown pitted, 1.5 mm. across in the axils of the raphides.

Type specimen number 12585, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, February, 1911.

This beautiful species the writer discovered in rich alluvial soil along the old Spanish road leading through dense forests five miles north of the town. Named in honor of the late *C. B. Clarke* who has done considerable work on our Philippine *Acanthaceae* as well as on other groups.

RUELLIA Plum.

Ruellia philippinensis Elm. n. sp.

Erect biennial; stem solitary, crooked and nodulose, subherbaceous, terete, the old basal portion glabrous and yellowish gray, otherwise greenish and puberulent, 2 mm. thick, unbranched, 2 dm. high. Leaves ascending or the lower ones horizontal, submembranous, darker green on the upper glabrous side, beneath also glabrous except the nerves when young puberulent, opposite, only with 2 or 3 pairs toward the top, in the dry state blackish brown especially on the upper surface, entire, unequal in size, ovately oblong to elliptic, gradually tapering toward the blunt acute apex, obtusely rounded at base, the large blades 6 cm. long by one half as wide below the middle; petiole less than 1 cm. long, finely yellowish pubescent; midvein similar in vestiture, the 3 to 5 lateral pairs ascendingly curved, reticulations coarse and quite evident from beneath. Flowers 2 or 3 in subsessile axillary clusters, erect, subtended by a number of foliaceous bracts; bracts puberulent, linear to oblongish, membranous, narrowed toward the base, entire, the outer or larger ones nearly 2 cm. long; calyx also greenish, 4 to 5 mm. long, setaceously acuminate, cinereously puberulent on the exterior, the 5 segments united at the very base; elongated bud cinereous; corolla over 2 cm. long, cylindric toward the base, the middle portion saccate and puberulent, the lobes widely spreading; lobes 5, subequal, subrotund or broadly oblong, nearly 1 cm. long and one fourth less in width; stamens all fertile, 4; filaments flattened, glabrous, attached below the middle of the corolla, the longer ones 4.5 mm. long, the shorter pair only one half as long and inserted a trifle above the longer ones; anther ovately oblong, 2 mm. long, basifixed and sagittate at base, apex mucronate, usually curved; ovary obovoidly oblong, nearly glabrous; style slender, finely pubescent. Capsule straw brown, 1 cm. long at least, stipitate toward base, 4 mm. wide above the middle, obscurely angular, apex very blunt, 2-celled, about 2-seeded; the retinaculae needle-like, bearing the brown quite smooth 1 mm. wide lenticular seeds.

Type specimen number 12922, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Found in moist humus covered alluvial soil bearing copses on the raised banks of the Iwahig river at 25 feet altitude.

Apparently *Ruellia* according to *Engler* and *Prantl's* Pflanzenfamilien.

HALLIERACANTHA Stapf.

Hallieracantha pulgarensis Elm. n. sp.

A suberect biennial herb; stem 8 mm. thick, dark green, terete, nodulose, reclining and taking roots at the basal joints, 1 m. long or longer, branched only toward the top; branches suberect and zigzag, fluted or rugosely angled, green and glabrous. Leaves horizontally spreading, flat, membranous, dark green above and much paler beneath, with cystoliths, well scattering alternatingly or only opposed by an ovately lanceolate green and sessile bract 1 cm. long, the larger lamina 18 cm. long by 6 cm. wide at the midde, dull greenish when dry, slightly inequilateral, entire the usually recurved and subfalcate apex sharply acute to acuminate, base slenderly cuneate; midvein yellowish brown beneath, rather broad but flattened, shallowly grooved on the upper side; lateral nerves 5 to 9 on each side, ascendingly curved, similarly conspicuous beneath, their terminal portion very coarsely reticulated; petiole 1 cm. long or less, fluted or ridged, glabrous, caniculate on the upper side. Inflorescence usually solitary from the leaf axils, erect, dark green, the strict 1.5 cm. long peduncle striate and nearly glabrous; flowers several in an umbel-like cluster at the end of the peduncle; pedicel 2 to 3 mm. long, puberulent or becoming subglabrous, subtended at the base by a number of bracts; bracts setaceous, broadest at the base, erect, unequal, the outer or larger ones nearly 3 mm. long, hispidulous; calyx pale green, linearly setaceous, the 5 segments united at the very base, finely glandular pubescent, 1 mm. wide at the base; corolla white or creamy white, 1.5 cm. long, 5 mm. wide across the upper inflated one half, glabrous, the basal one third constricted, 2-lipped; one of them with 3 rugose lobes and conspicuously reticulately veined; the opposite lip much narrower and shorter, striately veined, broadly notched at the apex; both of the stamens are fertile; filaments slenderly curved, 5 mm. long, glabrous, attached below the middle of the corolla; anthers broadly ovate, 1.5 mm. long, basifixed, notched at both ends, slightly superposed; ovary brown and likewise glabrous, inserted upon the much thickened basal portion; style also glabrous, slender, equalling the corolla, the stigmatic portion as thick and strongly recurved.

Type specimen number 13061, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in moist fertile ground deeply covered with humus in the dense forests at 750 feet altitude, along the trail to Napsan.

HEMIGRAPHIS Nees

Hemigraphis hirsuta Andr.

Field-note:—Erect perennial, 1 to 2 feet high, forming colonies in rich compact moist soil of well shaded copses at 25 feet altitude; stem terete, creeping and taking root at the joints near the base, unbranched, dirty green, nodes fusiformly swollen, the larger stems occasionally branched from the base; leaves flat, horizontally spreading, very deep green above, much lighter green beneath, subcoriaceous; stems 0.25 inch thick; inflorescence arising from the uppermost leaf axils, erect, obscurely angular, the flower bearing portion 1 to 3 inches long; bracts flat, ascending, deep green, densely ciliate along the margins; flowers ascending, ultimately divaricate, the tubular basal portion whitish, purplish blue otherwise, at least 0.5 inch long, curved, the short and broad segments strongly recurved. "Limocong" is the Tagbanua name.

Represented by number 12671, *Elmer,* Brooks Point (Addison Peak), Palawan, February, 1911.

Hemigraphis hirsuta crenata Elm. n. var.

Bi or perennial; stems quite rigid toward the reclining base, always less than 1.25 cm. thick, terete, dull green and rough by reflexed spicules, puberulent especially at the purplish brown and fusiformly swollen nodes, striking root at the lower joints, freely rebranched from the base; branches grooved along the 2 sides, also puberulent. Leaves scattered, opposite, subcoriaceous or membranous, ascending and slightly recurved toward the acute apex, much lighter green below, turning dull green when dry, base obtuse or obtusely rounded, diverse in size, the larger blades 8 cm.

long by 4 cm. wide at or a trifle below the middle, entire around the base, otherwise crenately toothed, oblongish or ovately elliptic, hispid beneath and especially along the margins, smoother on the upper surface, the uppermost leaves much smaller; midvein dirty brown beneath, the 6 pairs of nerves less prominent, ascending and strongly curved toward their tips, reticulations none; petiole 2 cm. long or shorter, slender, hispidly pubescent. Inflorescence arising from the uppermost leaf axils, usually subtended by diverse foliaceous bracts, upon slender puberulent suberect 1 to 3 cm. long stalks; spikes erect, loosely flowered, about equalling the peduncle in length, appearing obscurely 4-angled; flowers opposite, each subtended by an erect foliaceous bracteole; this green bract 1.25 cm. long, oblong or broadly lanceolate, petiolate and strongly curved upwardly at the base, margins denticulate and ciliate, the stout midvein also ciliate toward the apex; calyx segments 10 to 15 mm. long, 5 in number, linear lanceolate, ciliate along the margins above the middle and toward the caudate apex, the longer 1.5 mm. wide below the middle, the two smaller ones narrower and shorter; corolla white except the short purplish blue segments and the yellowish zone on the inside at about the middle, 1.7 cm. long, tubular toward the base, the upper two thirds saccate, glabrous, bearing at the apex 5 broadly oblong segments; stamens fertile, 4, inserted upon the middle portion of the corolla, the adnate portion ciliate as well as the free portion of the longer filaments; longer filaments 3 mm. long, flattened, provided with hyaline hairs, the shorter pair less than one half as long and glabrous; anther linear, 1.5 mm. long, subdorsifixed, sagittate at base, notched at apex, the back reddish brown, cell walls whitish; ovary obovoidly elongated, glabrous, brown, bearing a very slender minutely ciliate style 1 cm. long. Capsule 1 cm. long, more tapering toward the base, angular, fluted, 2-celled, 8-seeded, blunt at apex which opens first in dehiscence; seed lenticular, at least 1.5 mm. across, reddish brown, densely hairy along the edges, borne by the sharply curved and pointed raphides.

Type specimen number 12678, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Collected in moist humus covered fertile soil of densely shaded woods at 25 feet altitude. "Panisig" is the native or Tagbanua name.

Associated with the species and in the field it could readily be distinguished.

LEPIDAGATHIS Willd.

Lepidagathis inaequalis Clarke.

Field-note:—A somewhat succulent biennial herb, creeping in wet fine gravelly soil on exposed stream banks at 50 feet altitude; stems branched, taking root at the joints, finally suberect, angular, reddish tinged; leaves spreading, thinly coriaceous, much paler green beneath, the zone of the main nerves yellow on the upper otherwise dark green surface, flat; inflorescence terminal or subterminal, erect; the dense greenish bracts secundly arranged; flowers delicate, ascending, pure white except the middle lobe of the lower lip which has a bright purple spot on the upper side, tubular except the constricted basal portion, nearly 0.25 inch long; inner bracts as well as the calyx whitish with green tips or segments.

Represented by number 13028, *Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Lepidagathis amaranthoides Elm. n. sp.

Erect herbs; stem purple red with greenish striae, terete, solitary or few from the same root, 3 to 8 dm. high, sparingly branched above the middle, less than 5 mm. thick at the base, glabrous, puberulent at the joints or nodes. Leaves slightly ascending, subcoriaceous, dull deep green above, whitish so beneath, opposite, widely scattering, nearly flat and horizontal, curing dull and unequally green, margins entire or nearly so, abruptly cuneate and attenuate toward the base, apex obtuse, in the dry state marked with cystoliths from both sides, ovately lanceolate to oblongish or the uppermost ones linear to lanceolate; the normal blades 12 cm. long by 5.5 cm. wide below the middle; petiole purplish, slender, 3 cm. long for the longer leaves, gradually extended into the decurrent blade, very short in the uppermost small leaves; midvein puberulent on its sides below, dirty brown; lateral nerves in the larger leaves about 6 pairs, much ascending but only slightly curved, equally visible from both sides, tips reticulately united. Inflorescence composed of short glomerated spikes, from the uppermost leaf axils, upon short or more elongated common erect stalks which are somewhat edged and finely ciliate, solitary or 2 or 3-clustered from the same cluster, subtended by a diverse set of foliaceous bracts, 1 to 2 cm. across; the larger spikes occasionally short branched, the rachis puberulent, secund flowers numerous and when in anthesis divaricate, bracts greenish but with blackish tips, when old becoming purplish, 2 to each flower, 3.5 mm. long, keeled, oblong, slightly united and hirsute at base, sharply pointed, margins above the middle with tack shaped hairs; calyx segments very similar, imbricate, erect, oblanceolate, glabrous toward the base, ciliate pubescent along the keel or midvein and margins, the inner two slightly shorter and narrower, all acuminately pointed; corolla purplish or white, at least 5 mm. long, throat hairy, otherwise glabrous, narrowly cylindric below the middle, expanded above it and obscurely bilobed, striate, the lower lip broader than the upper and two lateral ones purple blotched, all obtusely rounded at apex; stamens inserted at about the middle, 4, all fertile; filaments 0.5 mm. long, sparsely ciliate; anther yellow, cells unequally inserted, notched at apex, lobed at base, 0.75 mm. long, ovary 1 cm. long, ovoidly elongated, canescent toward apex; style nearly twice as long, sparingly hairy; stigma knob-like, larger than the style. Fruiting bracts rigidly chartaceous, brown, spinescent; capsule 5 mm. long, subcompressed, tapering from base to blunt apex, only the tip puberulent, separating into divergent halves, 2 celled, 4-seeded; seed lenticular, upon rigidly curved spines, puberulent, 1 mm. across.

Type specimen number 12615, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

On damp or moist ground of fertile wooded flats nearly at sea level. "Tiagang" is its local or Tagbanua name.

Differs from *L. incurva Don* (*L. hyalina Nees*) by its larger leaves, less congested inflorescence and with much thinner spikes. Quite similar to *L. javanica Blm.*, judging from the author's short description.

HYPOESTES Soland.

Hypoestes merrillii Clarke.

Field-note:—Rather rank and somewhat succulent, bi or perennials, in rich humus covered soil of dense forests at 25 feet altitude; stems subterete, smoothish, always less than 0.5 inch thick, purplish brown at the slightly swollen nodes, reclining at the base and taking roots at the joints, branched from the base; leaves flat, smooth, spreading, diverse in size, deep green above, much paler beneath; spikes slender and strict, terminal or from the uppermost leaf axils, the ascending odorless flowers arranged along the lower side; bracts green; flowers purple, divaricately tipped, deeply bilobed; style white, filaments purple; the basal portion of the corolla white and tubular. "Panisip" is the Tagbanua vernacular name.

Represented by number 12680, *Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

Hypoestes addisoniense Elm. n. sp.

Densely clustered perennials; stems numerous, 6 dm. high, the old ones persistent, terete, dark green, numerously branched from below the middle, yellowish brown puberulent or toward the base glabrous; branchlets subangular and grooved along the two sides, rather numerous, thickened or flattened at the nodes. Leaves thinly coriaceous, scattered along all branchlets, flat, mostly horizontal, much deeper green on the upper surface, curing blackish, glabrous and with cystoliths on the nether side only, the upper ones smaller and lanceolate, the lower or larger broadly so or fusiformly oblongish, entire, the recurved tips acuminate to caudate, base acute or subattenuate, the largest lamina nearly 1 dm. long by 2.5 cm. wide across the middle or just below it; midvein subglabrous beneath, the 4 to 6 lateral pairs, faint and very oblique, their tips much curved, reticulations not evident or very fine; longer petiole 1 cm. long, minutely grooved along the upper side, puberulent, those of the smaller leaves much shorter. Inflorescence in nearly all the leaf axils but especially in the upper ones; flowers few to severally clustered, erect, from the upper leaf axils, their pedicels short and thick and usually provided with minute bracts; calyx 3.5 mm. long, lanceolate, keeled and ciliate on the back as well as toward the apex; corolla 8 mm. long, slightly flattened, tubular toward the base, puberulent around the middle on the exterior, bilobed nearly to the middle, the veins in the throat region finely ciliate, the upper lip broad and 3-lobulate and reddish tinged, the lower or gradually tapering toward the yellowish white truncate tip; stamens 2, fertile; filaments upon the middle of the corolla, 2.5 mm. long, the free portion glabrous, recurved and exerted out of the 2-lipped sinuses; anther cells very oblique, nearly 1 mm. long, the lower one with a hyaline caudate point, compressed, rounded at apex; style slender, 5 mm. long, very sparingly ciliate, stigma slightly thickened; ovary dark brown, ellipsoid, 1.5 mm. long, upon a rim-like similarly colored base. Capsule 6 mm. long, 1.5 mm. thick at the middle, angular, bluntly pointed at both ends, fluted, 2-celled, 4-seeded, dehiscent from the apex into recurved halves; seeds 1.5 mm. long, broadly truncate at base, reddish brown pitted, rounded at apex, in the axils of the raphides.

Type specimen number 12715, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

In loose dry ground upon ledges of waterfalls or on sides of deeply shaded precipices along the Lara river at about 500 feet altitude.

Hypoestes pulgarense Elm. n. sp.

Loose suffrutescent tufts; stems few or several, subterete or more often reclining upon the adjoining thickets, 1 to 2 m. high or long, usually few branched from the base and more freely branched above the middle, terete, at most 8 mm. thick, dark green; branchlets slender, sparingly rebranched, the free ends drooping, tips subterete, angularly terete, oppressed puberulent when young; the soft odorless woody tissue green except the white pith. Leaves horizontal or descending, well scattered along the branchlets, opposite, recurved toward the obtuse or acute point, similarly pointed at the base, broader and more abruptly elliptic or ovately so, the average blades 7.5 cm. long and 4 cm. wide at the middle or just below it but frequently smaller, margins slightly involute in the dry state and entire or obscurely crenate toward the apical point, drying blackish brown, glabrous; midvein quite prominent beneath and rigid above, appearing as if appressed strigose; the 4 to 6 lateral nerves ascendingly curved especially toward their ends, less prominent beneath and evident from above, the fine reticulations beautifully marked with cystoliths; petiole averaging 5 mm. long, appressed puberulous. Inflorescence erect, chiefly in the uppermost leaf axils; flowers several, upon short rigid persistent pedicels which are more or less provided by minute bracts; calyx segments pale green, 3 to 4 mm. long, erect, 5, united at the base, lanceolate, ciliate along the midvein on the back and toward the sharply acuminate apex, 0.75 mm. wide below the middle; corolla albus but with age turning stramineus, 6 to 7 mm. long, tubular below the middle, inflated and deeply bilobed above it, streaked with purple in the throat, puberulent along the veins, one of the lips rather broad and 3-lobulate and red or pink, the other narrowed toward the truncate yellowish tipped apex; stamens 2, fertile; filaments inserted upon the middle of the corolla, glabrous, 2.5 mm. long; anther cells 1 mm. long, greenish, the lower cell caudate at base, the upper ones obtuse, oblique at apex, well exerted by the recurved filament through the sinus of the two lips; ovary glabrous, upon a thickened pedicel, 2 mm. long, bearing a slender and sparsely ciliate 4 mm. long style with a slightly enlarged stigma. Capsule 6 mm. long or longer, 1.5 mm. thick at the middle, bluntly tapering at both ends, smooth and glabrous, angular, loculicidally dehiscent, 2-celled, 4-seeded; seeds lenticular, brown, puberulent, in the axils of the sharply pointed raphides.

Type specimen number 12785, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in dry ground of a wooded flat at 250 feet altitude.

GYMNOSTACHYUM Nees

Gymnostachyum nudispicum (Clk.) Elm. n. comb.

Ruellia (?) *nudispica Clarke* in Philip. Journ. Sci. I, Suppl. IV; 248, 1906.

Field-note:—Perennial herbs in fertile soil packed with gravel stones along a creek bottom at 250 feet altitude and in dense woods interspersed with bamboos; stem reclining at the base, usually considerably raised above the ground surface, the leaf bearing portion erect, dirty green, with numerous slender fleshy roots; leaves soft membranous, the petioles ascending, the blades horizontally spreading, the upper surface mixed with darker and lighter green patches, beneath uniformly much paler green; peduncle badius as are also the bracts and even the calyx; flowers ascending, only slightly recurved, the basal one half tubular and white, the segments as well as the inflated upper portion violaceus, 0.75 inch long.

Represented by number 12794, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Gymnostachyum pictum Elm. n. sp.

Individual herbs or in small clusters; stem glabrous, terete and striate, subangular when dry, reclining and taking root at the lower joints, ultimately suberect, few branched, varying from 5 to 15 cm. long; branches relatively short, glabrous, curing black. Leaves alternate, coriaceous, smooth and glabrous on both sides, dark velvety green above and with ashy gray median zones which character is plainly evident even in the blackish brown dry leaves, obtusely rounded or merely rounded at the apex, flat and horizontal, pale green and occasionally purplish tinged on the lower surface which in the dry state is conspicuously lighter colored, the average blades 6 cm. long by one half as wide a trifle below the middle, elliptic or ovately elliptic, edges thin and entire, base very abruptly cuneate or occasionally the sides subtruncate; midvein dirty brown beneath, quite evident; the 4 to 6 lateral nerves equally evident beneath, gracefully curved ascendingly, their tips running close to the margins, reticulations obsolete; longer petiole 3 cm., gradually extended with the decurrent leaf base, glabrous, the upper ones or those of the smaller leaves much shorter. Inflorescence erect, green, chiefly solitary from the uppermost leaf axils, the glabrous spikes strict, glabrous, varying in length from 3 to 8 cm., flower bearing from the middle and chiefly at the top; flowers opposite, erect, the lower one scattering, rather close at end of spike, upon 3 mm. long and glabrous pedicels, subtended by a slightly longer puberulent or subglabrous setaceous bract; clayx 4 mm. long, setaceously lanceolate, puberulent or becoming glabrous, somewhat united at the base, 3-veined; corolla 10 to 15 mm. long, the basal glabrous portion tubular, otherwise inflated and puberulent on the exterior, whitish; lobes unequal or obscurely 2-lipped, about 5, broadly rounded, 1 to 2 mm. long; stamens 2, fertile; filaments nearly 3 mm. long, straight, attached to the corolla below the middle, included, glabrous; anthers 2.5 mm. long, linear, muticous at apex, sagittate at base and basifixed; ovary glabrous, columnar, 2 mm. long; style equalling the corolla, very slightly hairy toward the base, stigmatic portion recurved. Capsule linear, with 4 rounded spikes, glabrous, at least 5 cm. long, 2-celled, dehiscing from the apex into 2 loculicidal carpels, about 18-seeded; seeds brown, lenticular, 1 mm. across, apparently smoothish and glabrous.

Type specimen number 13182, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in red clay of a humid forested steep ravine near a stream at 2500 feet altitude, usually around the lower edge of uncovered bowlders upon rocky outcroppings.

Gymnostachyum palawanensis Elm. n. sp.

Low biennial herbs of diverse sizes; stems numerously branched, short, green, subterete, taking root at the basal joints, more or less angular, striate, puberulent when young, from 3 to 8 cm. long or longer; branchlets suberect, angular and fluted. Leaves thinly coriaceous, horizontally spreading over the ground, entire, obtuse or rounded at the apex, base obtuse or truncately rounded, deep velvety green above except the glaucous green portion along the midrib and more prominent lateral nerves, much paler beneath even in the brownly cured state, the larger blades ovate, the smaller elliptic, both sides with scattered short hispid hairs, entire, the larger ones 3 cm. long by one half as wide below the middle, most of the leaves much smaller, opposite; midvein black from both sides but especially from beneath; the lateral nerves 3 or 4, ascendingly curved, tips barely united, reticulations none; longer petiole 1 cm. long but much shorter in the smaller leaves, short pubescent. Inflorescent spikes erect, usually solitary, 3 cm. long, strict or curved, subglabrous, flowers chiefly above the middle; flowers in opposite pairs, the lower ones widely scattered; calyx light green, short stipitate, about 6 mm. long, the 5 segments united at the base; the lobes rather thick, 1 mm. wide at the base, gradually tapering to the sharply acuminate point, short hispid on the back; corolla gracefully recurved, 13 mm. long, cylindric below the middle, inflated, somewhat compressed above the middle and sparingly ciliate, shallowly bilobed; upper portion with 2 rather broad lobes, coeruleus blue, the lower with 3 lobules and with a membranous pouch or tongue on the upper side at about the throat, in the bud state glandular pubescent; stamens 2, caesius, fertile, erect, included; filaments inserted upon the middle of the corolla tube, 2.5 mm. long, straight, glabrous; anthers about as long, linearly oblong, 0.75 mm. wide, bluntly apiculate at apex, sagittate at base, basifixed; ovary columnar, nearly 2 mm. long, 0.75 mm. thick, puberulent, inserted upon a glabrous base; style nearly 1 cm. long, sparsely strigose except the stigmatic portion. Capsule upon 2 mm. long pedicels, at least 1 to 2 cm. long, 1.5 mm. thick, blunt, dehiscent from the apex into 2 recurved carpels; seeds 5 to 8 in each of the 2 cells, lenticular, brown, nearly glabrous and 1 mm. across, inserted in the axils of the raphides.

Type specimen number 12741, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Forming dense patches in compact soil of open deforested places at 250 feet altitude.

Related to but not identical with the preceding. Also to be compared with *G. decurrens Stapf.*

Gymnostachyum subcordatum Elm. n. sp.

Caespitose perennial herbs; roots terete, flexible, dirty yellowish; stems similar, creeping, branched, their branchlets suberect, crooked and quite rigid toward the base, densely tomentose. Leaves opposite, 1 to 2 cm. apart, horizontally spreading, subcoriaceous, rather rugose and darker green on the upper surface, nearly flat, much paler or lighter beneath even in the dry state, entire, pulverulent or finely hispidulous on the upper side, velvety tomentose beneath, apex rounded or occasionally broadly obtuse, base broadly rounded to cordate, usually subcordate, the larger lamina 5 cm. long by 3 cm. wide across the middle or below this, elliptic to rotund, occasionally ovately so; midvein tomentose beneath, puberulent above; lateral ones 3 or 4, most of them arising from near the base and much ascendingly curved, their tips scarcely united, reticulations obsolete; longer petioles 4 cm. in length, occasionally lilacinus, densely velutinous pubescent, the shorter ones less than 1 cm. long, thick and fleshy. Spikes olivaceous pubescent, few to several, seldom solitary, terminal, rather strict and erect, greatly varying from 5 cm. to 2 dm. in length, usually flower bearing from below the middle; flowers somewhat scattered at the base, secund, ascending, subtended by 3 bracts, sessile; bracts strongly 3-veined, 3 mm. long, lanceolate, pubescent, 1.25 mm. wide at the base; calyx segments 5 mm. long, united at the base, the inner ones shorter and narrower, otherwise similar to the bracts; corolla 7 mm. long, saccately tubular below the middle, the upper one half 2-lipped, puberulent along the veins in the throat region and on the exterior, the larger lip veiny, broad and 3-lobed; the opposite lip elliptic, hyaline and emarginate at the apex; stamens 2, fertile; filaments thick, brown, glabrous, inserted upon the middle of the corolla or a trifle below it, 1.5 mm. long; anthers 2 mm. long, bilobed and basifixed at the base, apiculate at apex, somewhat dorso-ventrally compressed, reddish brown on the back, introrse, 0.75 mm. wide; ovary ellipsoid, 1.5 mm. long, glabrous, bearing a 3 mm.

long slightly hispid style; stigma minute, greenish. Capsule 1 cm. long, 2 mm. thick, angular and grooved, puberulent, equally blunt at both ends, 2-celled, 8-seeded; the seeds ciliate along the edges, inserted upon the axils of the raphides.

Type specimen number 12729, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Covering the more or lesss andy soil of banks along woodland streams at 250 feet altitude.

Apparently related to *G. cumingianum Nees* and *G. affine* of the same author, but our leaves are of a different cut.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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NEW ANONACEAE

by

A. D. E. Elmer

ARTABOTRYS R. Br.

Artabotrys cumingiana subglabra Elm. n. var.

A sprawling climber; stem tough, terete, 1.25 cm. thick, smooth, brownish except the green branchlets which turn blackish brown when dry; wood whitish, sweet, odorless, with a dull pith. Leaves alternate, coriaceous, dull deep green above, much paler green beneath, very shallowly folded upon the upper side, the abrupt obtuse to acute tips recurved, glabrous, drying very unequally brown on the 2 sides, entire, 12 to 15 cm. long, 5 to 7 cm. wide at the middle, base obtusely rounded, oblong; midvein stout beneath, finely punctate along the upper side, very sparsely strigose along its sides on the under surface; nerves 7 to 9 pairs, their ends coarsely anastomosing, reticulations quite evident from both sides; petiole less than 1 cm. long, shallowly grooved on the upper side, glabrous. Inflorescence along the twigs below the foliage, usually one or more flowers from the ends of the stout green much flattened and recurved or hooked peduncle; pedicel 2 cm. long, curved, subtended at the base by minute bracteoles, slightly thickened toward the distal end, very sparingly strigose; calyx barely united at the base, 5 mm. long, subelliptic, obtuse at the apex, strigosely pubescent except the finely papillose middle basal portion of the upper surface, persistent and spreading; petals very thick and rigid, very finely cinereous on both sides especially dense on the somewhat constricted outer basal portion and on the cushion of the ventral side; the larger 3 petals 2.5 cm. long, elliptic, 1.5 cm. across the middle, rounded at the base, that portion on the upper side covering part of the stamens glabrous; the smaller whorl of 3 petals 2 cm. long by 1 cm. wide, prominently constricted and obscurely angular at the base, the ventral basal portion glabrous as are also the sides at the base on the back, apex obtuse; torus flat, the peripheral or stamineal portion glabrous, the central or pistillate portion densely hairy; anthers contiguous, 2.25 mm. long, flattened, the connective much thickened at apex, sacs extending along the dorsal edge to nearly base.

Type specimen number 12338, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Provincc of Capiz, Sibuyan, April, 1910.

Sprawling over thickets of a moist alluvial flat along the Sinuban creek at 500 feet altitude.

Differs mainly from the type in being subglabrous and in the difference of the petals.

Artabotrys cumingiana reticulata Elm. n. var.

Scandent and looping shrub; main branches hanging and repeatedly rebranched, slender but the lateral ones relatively short, very tough; twigs brown and glabrous. Leaves horizontal or descending, subcoriaceous, nearly equal green on both sides, turning brown while drying, glabrous, scattered alternatingly, entire, apex acuminate, base broadly obtuse or subrounded, oblong, the normal ones 4 by 12 cm. in size; midrib reddish brown and edged beneath; the lateral 7 to 10 nerves ascendingly recurved, their tips united few to several mm. below the leaf margin, also conspicuous beneath and very evident from above, reticulations coarse and a trifle plainer from the upper side; petiole 3 to 5 mm. long, subglabrous. Inflorescence a short recurved flattened hooked branch at the end of the second year old twigs; peduncle 2 to 3 cm. long, only toward the distal end with one or two short stout branches; flowers usually few clustered at the brown pubescent thickened end or receptacle of the branches; pedicels averaging 1.5 cm. long, umber brown pubescent, subtended by similarly hairy caducous bracts; calyx segment 3, pale green, ovately elliptic to oblong, 1 cm. long, 6 mm. wide, coriaceous, united toward the base, velvety tomentulose except the inner basal portion, the acute to acuminate point reflexed in anthesis; petals 6, erect, similar, thickly coriaceous, greenish yellow, 1.5 cm. long, 1.25 cm. wide across the middle or across the widest portion, elliptic, shining velvety appressed puberulent except the upper basal portion which forms a ring of pouch over the sex organs, imbricate, the inner 3 slightly shorter and more constricted toward the arched basal portion; receptacle flattened, glabrous except the imbricate border; stamens numerous, imbricate, yellowish, 1.5 mm. long, short stipitate and usually subtended at the base by subhyaline hairs, connective thickened and truncate toward the distal end; anthers light yellow, laterally dehiscent, scarcely more than 1 mm. long; pistils relatively few in the apical cluster, nearly 3 mm. long, the basal two thirds thick and pubescent, the stigmatic portion bent or curved, conically elongated and pointed.

Type specimen number 13608, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in moist rocky soil of a humid wooded depression at 3750 feet altitude, between the peaks of Duros and Cawilanan. The natives or Manobos call it "Cabak-cabak."

Most closely related to *A. cumingiana glabra Elm.* but our leaves are smaller, more acuminate and much more reticulately nerved.

Artabotrys vidaliana Elm. n. sp.

A looping climber and sprawling over woods; main branches long, repeatedly rebranched, hanging from the tops of trees over the river; stem terete or nearly so, 5 cm. thick, bendable, porous, with fine rays, odorless and tasteless; bark brown, scaling in very small scales, deeper brown on the inner side; the ultimate branches relatively short and divaricately disposed, very tough, the brown young portion glabrous. Leaves horizontal, recurved especially the abruptly acute or obtusely pointed apex, base broadly obtuse, the entire margins subinvolute in the dry state, curing isabellinus on both sides, glabrous, alternatingly scattered along the twigs, flat or folded on the upper darker green surface, subchartaceous, exceedingly variable in size, oblong, the normal ones 15 cm. long, 6 to 7 cm. wide at the middle; midvein glabrous and brown, prominent beneath, flat on the upper side; lateral pairs 7 to 9, oblique, tips obscurely united, equally visible from both sides, reticulations coarse and relatively conspicuous from both sides; petiole 1 cm. long or less, stout, reddish brown and glabrous, flattened and shallowly grooved along the upper side, always glabrous. Flowers arising from recurved dwarfed flattened branchlets below the foliage, pendant; pedicels 1 cm. long, strict, cinereous or subglabrous, subtended by blunt similarly pubescent bracts; calyx pale green, star shaped, widely spreading, the 3 segments only slightly united at the base; sepals nearly 7.5 mm. long by 5 mm. wide across the base, thick and rigid, glabrous on the upper side below the middle and obscurely papillose, otherwise densely strigose, the margins toward the sharply acute apex revolute in the dry state; corolla ochraleucus, flat with obtusely rounded incurved tips, very thick; outer 3 nearly equal, ovate, with a sort of a basal constriction which closes in over the stamens, 1.5 to 2 cm. long, 1.25 cm. wide below the middle, glabrate or about the basal portion very finely pubescent; the upper 3 lobes somewhat shorter and narrower, widest across the middle, gradually constricted toward the base which is connivent at the top, on the lower side extended into thick 4 mm. long incurved teeth; anthers 2 mm. long, yellow, the connective side smooth and peltately expanded at the apex, the anther sacs along the opposite side of the connective.

Type specimen number 13007, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in clay or red soil with a gravelly subsoil upon wooded banks of the Iwahig river at 500 feet altitude. Dedicated to *Vidal y Soler*.

It is nearest to *Vidal's* species or *A. cumingianus* than to any other of Philippine *Artabotrys*.

DEPRANANTHUS Maing.

Deprananthus apoensis Elm. n. sp.

Very slender trees; trunk terete, 1.5 dm. thick, toward 10 m. high, branched toward the top only; branches quite numerous, divaricately spreading, 2 to 3 m. long, only sparingly branched, 2.5 cm. thick, only the tips ascending; wood soft, fibrous, whitish, odorless and tasteless; bark finely mottled, smooth, grayish white, green on the twigs, easily stripping, the ultimate ones densely fuligineusly pubescent. Leaves well scattering along the entire length of the branchlets, alternate, a trifle descending, dull green on the upper nearly flat surface, yellowish so beneath and shallowly concave, leathery, entire, apex abruptly constricted into an acute point, base obtuse, obovately elliptic to oblongish or subrotund, when young soft and densely fuligineus pubescent on both sides, alternate, becoming glabrate on the upper side except along the grooves of the nerves, beneath always soft pubescent, diverse in size, the larger blades 3.5 dm. long, 1.5 dm. wide above the middle, frequently much smaller yet of the same shape; midnerve very bold and densely umber brown pubescent, avellaneus puberulent along the shallow upper side; lateral nerves 7 to 14 pairs, divaricate, straight, tips interarching, relatively conspicuous, similarly pubescent, cross bars and reticulations very faint; petiole very stout, 1.5 cm. long, densely pubescent. Inflorescence leaf opposed, pendulous from short tubercles, yellowish green, sweetly fragrant; peduncles thick, ligneous, from 1 to 3 cm. long, the young portion short brown pubescent, occasionally branched or 2 or more from the base, the old or basal portion gray and glabrous; pedicels 1 cm. long or less, similarly pubescent, subtended by bracts; calyx 7.5 mm. long, the 3 segments nearly free, 5 mm. wide across the base, ovate, thick and rigid, pubescent except the upper basal portion; petals 6, slightly unequal, the outer 3 a trifle longer and somewhat wider, 3.5 cm. long, 6 mm. wide across the middle, gradually tapering to the acute apex, obscurely constricted toward the base, with a thickening on the upper side 5 mm. from the base, velvety pubescent, the inner segments less than one half as wide, falsely united over the stamens, similarly pubescent except the inside of the expanded basal portion and that portion on the outside covered over by the outer segments; stamens indefinite, sessile, 1.5 mm. long, cuneate, the connective expanded at the top and crustaceous; the circular stigmatic mass in the center and exceeding the stamens, coriaceous, its style column densely hairy; young fruits light or yellowish green, 2 to 3 cm. long, subcylindric, 1 cm. thick, upon a thick green receptacle.

Type specimen number 11290 and 10843, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August and June respectively, 1909.

This palm-like tree was discovered on steep wooded slopes of the Baracatan creek and Baruring river at about 2750 feet elevation. "Manayacut" is the native or Bagobo name. In northern Agusan province it is quite plentiful. Its sweet and strongly fragrant flowers are occasionally brought down to the Christian towns by the hill people, and in these valley towns its oil essence is crudely extracted and used in local soaps.

GONIOTHALAMUS Blm.

Goniothalamus gitingensis Elm. n. sp.

A tree-like shrub; stem 5 cm. thick, 3 to 4 m. high, crooked and branched from below the middle; wood very soft, with a strong agreeable peppery green odor, dirty white, tatesless; bark smooth, dull brown; branches divaricately spreading, sparingly rebranched, the twigs very flexible and glabrous at all time. Leaves horizontal, flat except the abruptly recurved acute to acuminate tips, base broadly obtuse or obtusely rounded, margins entire but recurved at least when dry, dark and dull green above, much lighter or yellowish green beneath, coriaceous, curing avellaneus on both sides, oblong, varying from 1 to 2 dm. long, from 3.5 to 5.5 cm. wide, alternatingly scattered along the branchlets; midrib ridged beneath, caniculate along the upper side; primary lateral nerves 7 to 11 pairs, usually alternating with secondary ones toward the midrib, oblique, rather obscure beneath and more evident from above, tips ascendingly curved but not united, reticulations coarse and more evident on the upper surface; petiole very dark purple brown, glabrous, deeply channelled along the upper side, thick, 5 to 8 mm. long, rough and nearly black when dry. Flowers solitary, pendulous from the branches, upon dull red 1.5

cm. long glabrous pedicels which is slightly thickened toward the distal end, inserted upon a 5 mm. long and numerously bracteated peduncle; calyx thick, glabrous, the basal united portion low cup shaped, the 3 lobes 8 mm. wide and nearly as high, roundly obtuse, spreading, persistent; petals 6, in 2 very unequal series, deciduous, glabrous; outer petals 3 cm. long, lanceolate, almost 1.5 cm. wide, base somewhat narrowed and quite thick, slenderly acuminate, margins rolled in upon the upper side; inner series 1.5 cm. long, very thick and rigid, ovately elliptic, acute, the upper two thirds valvate and forming a triangular pyramid, the inner basal portion striately folded; receptacle glabrous, flat; anthers numerous, sessile, linear, 3.5 mm. long, 0.75 mm. wide, compressed, the connective terminated into a subglobose dark brown stigma-like point; the pollen sacs along the edges thin, yellowish, appearing as if septate pistil 4.5 mm. long, the upper one half stipitate and usually curved, linearly flattened otherwise, glabrous, stigmatic portion rugosely forked.

Type specimen number 12507, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910.

Discovered in moist stony soil of a forested ridge of mount Giting-giting at 4500 feet elevation.

With two or three other closely allied Philippine species it has strong affinities with *G. giganteus Hook.* My fruiting specimen number 7419 is allied to and possibly the same as the flowering specimen of *Cuming* 1746; our species here described has entirely different flowers than those on *Cuming's.*

Goniothalamus epiphyticus Elm. n. sp.

An epiphytic shrub; stems several, ascending or horizontal and even drooping, slender, 2 m. long, 1.5 to 2 cm. thick, terete, quite rigid, sparingly rebranched; branchlets drooping, their tips ascendingly curved, tough, covered with smooth light gray bark, even the young terminal portion glabrous. Leaves alternating, 1.25 cm. apart, somewhat arranged in distichous, rows, glabrous, rigidly coriaceous, descending or drooping, very shallowly conduplicate on the upper lucid and deeper green surface, the acute to acuminate apex abruptly recurved, base broadly obtuse, narrowly oblong, the entire margins subinvolute in the dry state, curing deep brown beneath and nearly black on the upper side, the normal lamina 12 cm. long by 3.5 cm. wide at the middle; midrib raised and edged beneath, deeply grooved on the upper side especially toward the base; lateral nerves very obscure, 10 to 13 on each side and slightly more evident from above, reticulations obsolete; petiole 5 to 8 mm. long, black, glabrous, broadly caniculate along the upper side. Young infrutescence axillary or lateral; peduncle mostly solitary, terete, green, glabrous, at the base surrounded by scars of already fallen bracts, thickened toward the distal end, strict and stout, 3 to 5 cm. long; receptacle flattened, 7 mm. across; old ovary densely fulvus pubescent, fusiform, 5 mm. long, bearing a very short glabrous style and an expanded dull brown stigma; young fruits subcompressed, straight along the ventral edge or side, pointed, thick stipitate at the base, soon wearing glabrous.

Type specimen number 13830, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912. Here also is referred my number 13535 from the same region.

Inhabiting the moss and vine covered upper side of large inclining tree trunks and in the axils of lowermost limbs twenty feet above the humid ground, in dense forests bordering lake Donao at 5000 feet altitude. "Lanotan" is the Manobo name. Number 13535 is an erect shrub and was gathered upon a dry wooded riged at 3000 feet altitude and apparently it is the same species.

Goniothalamus mindanaensis Elm. n. sp.

A small but rather slender tree or shrub-like; stem terete, crooked, 10 cm. thick, 5 m. high or higher, chiefly branched toward the top; wood quite soft, whitish, without odor or taste; bark testaceus except the smooth yellowish gray surface; main branches slender, somewhat drooping, only sparingly rebranched, the young tips ferrugineously pubescent but soon becoming glabrous or remaining puberulent. Leaves coriaceous, horizontal or descending, recurved at the abruptly acute apex, alternatingly scattered toward the end of the twigs, broadly obtuse or rounded at base, the margins entire and slightly involute in the dry state, drying nearly equally brown on both sides, much elongated, 3 dm. long by 8 cm. wide at or above the middle, glabrous but minutely pulverulent on both sides especially along the median region; midrib deeply caniculate above, prominently raised and edged beneath, subglabrous and puberulent; lateral nerves pinnate, obscure but equally visible from both sides, about 20 pairs, with frequent secondary ones intervening, their tips truncately united a few mm. below the edge, reticulations only, visible from the upper side; petiole less than 1 cm. long very much thickened, widely and deeply grooved along the upper side, puberulent but glabrous with age, nearly black in dried specimens. Bud flowers pendant, in clusters from small or larger very shortly branched ligneous tubercles (isolated flowers were seen along the branchlets without the tubercles); pedicel densely appressed with fulvus colored hairs, stout, less than 1 to 1.5 cm. in length, terete, thickened toward the distal end, glabrous when old, subtended around the base by broadly rounded unequal bracts; buds conically pointed, ferrugineously appressed pubescent; calyx persistent, spreading, very thick and rigid, united at the base, the 3 segments ovately triangular, 5 mm. long and as broad across the base; petiole 6, the two series unequal; the outer 3 richly ferrugineously hairy on the back, glabrous on the inner side, thickly coriaceous, early falling even while the inner ones are yet in the bud state, the median line toward the acuminate point creased, broad at the base and sides toward the apex incurved, the larger ones collected 1.5 cm. long by 1 cm. wide across the base; the inner 3 petals flatly conical in the bud state and densely cinereously pubescent on the outside, valvate and creased along the edges, rather conspicuously pointed, at the base very shortly and truncately clawed, ovately triangular in shape, 7 mm. long and wide below the middle; receptacle glabrous, circular, 5 mm. in diameter; stamens very numerous, linear, 2 mm. long, closely packed, the lateral anther cells very linear, the thickened apex somewhat hairy in the young state; female flowers clustered in the center, appearing nearly black, as long as the male flowers, glabrous, also linear, bearing at the apex an abruptly tipped appendage or stigma.

Type specimen number 14024, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

This shrub-like tree inhabited wet loose earth on ledges bordering densely shaded stream banks at about 1250 feet altitude. Also called "Lanotan" by the natives or Manobos.

Number 10982 from mount Apo was distributed as *G. philippinensis Merr.* and from leaf character it is the same as the present new species. They both differ quite materially from the leaf character of *Merrill's* type number. Furthermore, the fruits of 10982 is not the same as those on the type of *G. magnificus Elm.*, the gnarly woody tubercles on my *G. mindanaensis* are characteristic.

MEIOGYNE Miq.

Meiogyne philippinensis Elm. n. sp.

A strict erect tree; stem 8 m. high, 2 dm. thick, branched from below the middle; wood hard, yellowish white, odorless and tasteless; bark smoothish or more or less lenticelled, brown and gray mottled; branchlets divaricate, rather long, laxly rebranched beyond the middle; twigs somewhat drooping, the young tips finely covered with olivaceus hairs. Leaves submembranous, alternatingly scattered, similarly spreading, shining green above, when young pubescent beneath, drying dull gray on both sides, apex acuminate, base broadly obtuse or usually rounded, the margins entire, oblong or subovately oblong, the average blades 1 dm. long and 4 cm. wide at the middle or below it, frequently much larger or smaller; midvein dull and olivaceus pubescent beneath, the groove on the upper side becoming smooth, rather conspicuous; lateral nerves of 7 pairs, ascendingly curved, also conspicuous from beneath, tips anastomosing; petiole 5 to 7.5 mm. long, shallowly caniculate, covered with fine olivaceus hairs. Flowers dull yellow, pendulous from the leaf axils, usually solitary, odorless; peduncle 5 mm. long or less, similarly hairy, with a few broad alternating bracts; calyx segments 3, ovate, united at the base, spreading, hairy on both side, subequal, 5 mm. across, the outer 3 petals ovately lanceolate or oblong, nearly 1.5 cm. long by 5 mm. wide below the middle, densely pubescent on both sides, erect; the inner 3 thicker in texture, ovately oblong, 1 cm. long by 5 mm. wide toward the base, the ventral basal portion glabrate and well directed over the stamens and pistils, otherwise tomentose; receptacle faintly strigose; anthers many, subsessile, forming the greater mass of the hemisphere, 1.5 mm. long, much broadened toward the apex, the blackish connective expanded at the apex, the pollen sacs straw brown on the dorsal side and nearly extending to the base; pistils 3, style densely hairy, thick, bearing a depressed glabrous stigma.

Type specimen number 11318, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in rich humus covered soil of damp forests on the south side of the Sibulan river at 4000 feet altitude. "Poogan" is its Bagobo name.

Meiogyne lucida Elm. n. sp.

A small and erect tree; stem 16 cm. thick, terete, 8 m. high, chiefly branched toward the top; wood moderately soft, yellowish tinged except the outer whitish portion, odorless and without taste; bark grayish and brown mottled, smooth, isabellinus except the surface; main branches long, divaricate, repeatedly branched; the lax twigs somewhat drooping, ample, terete, gray but brown when young, apical portion strigosely hairy but soon glabrous. Leaves copious, alternating, scattered along the branchlets, horizontal or descending, chartaceous, lucid on both sides even in the dry brownish state, nearly flat, the abruptly acute to acuminate apex recurved, base broadly rounded, entire margins obscurely wavy toward the apex, the larger lamina 12 cm. long by 5 cm. wide below the middle, ovately oblong or subelliptic, frequently much smaller; midvein impressed along the upper surface, rather bold beneath, when old entirely glabrous; lateral nerves 5 to 7 on each side, the basal one not prominent, strongly ascending and curved, likewise bold beneath and shallowly impressed above, tips interarchingly united far below the edge of the leaf, cross bars and reticulations minute; petiole 5 mm. long or longer, flat and shallowly grooved along the upper side, hairy when young but glabrous when old. Flowers young, solitary or in pairs, from the leaf axils or in the axils of their scars, slightly descending; pedicel short, relatively thick, olivaceously hairy, provided with similarly hairy oblongish to rotund 3 to 4 mm. long loosely imbricating bracts the basal ones of which are narrower and shorter; calyx toward 8 mm. long by 2 mm. less in width at the base, the basal one third united, ovately acuminate, the apex blunt, the free portion ascending, margins usually curved upon the dorsal side, with the same colored hairs on the back and velutinous on the inner side; petals 6, very unequal in size, leathery, adnate, lanceolate from the base, velutinous on both sides, 1.5 cm. long and one third as wide at the base, free, gradually tapering to the acuminate and usually twisted or falcate tips, the inner 3 petals much smaller in the old flower and glabrous on the dorsal ventral side; receptacle small, flattend, subglabrous; stamens not very numerous, imbricate, 1.5 mm. long, cuneate, the terminal portion of the connective large and oblique, glabrous, the much lighter pairs of anther cells unequal in length and dorso-laterally attached; pistil 2 mm. long, hairy along the angular ovary portion, bearing a stipitate rather large stigma.

Type specimen number 13984, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Found along the upper edge of a steep forested slope in rather loose but well drained soil at 1250 feet altitude.

Our flowers are distinct from number 1738 collected by *Cuming* on the island of Leyte. The flowers are the same as on *M. philippinensis Elm.* but there are foliage differences.

MITREPHORA Blm.

Mitrephora viridifolia Elm. n. sp.

A small sized tree; stem 7 dm. thick, terete and straight, 12 m. high, branched from the middle; wood nearly odorless, tasteless, yellowish or yellowish brown, moderately hard; bark relatively thick, smooth and dull brown with occasional grayish blotches, isabellinus otherwise; main branches divaricate, slender, freely rebranched, twigs relatively short, crooked, also horizontally spreading, terete, grayish brown, the young portion densely melleus tomentose; leaves oblong, 4 to 6 cm. wide across the middle, 1 to 1.5 dm. long, submembranous, flat but the slenderly acuminate to caudate apex recurved, dull green but somewhat paler beneath, curing rather bright green on both sides, base broadly obtuse or obtusely rounded, the entire margins subinvolute in the dry state, alternating and rather copious, chiefly at the distal end of the terminal branchlets, glabrous except the veins and nerves on both sides; midvein prominent beneath and melleus tomentose, also hairy on the upper shallowly grooved surface; lateral nerves 10 to 13 on each side, parellel, ascendingly curved especially toward the more or less united tips, also conspicuous beneath, alike in vestiture, cross bars fine and very evident from the nether side; petioles usually with pubescent buds in their axils, 5 mm. long at most, 2 mm. thick, densely light tawny pubescent. Flowers usually in small groups along the branchlets and occasionally in the leaf axil; pedicels 5 to 7 mm. long, frequently arising from short common stalks, relatively thick, subtended at the base by alternating somewhat unequal bracts, densely deep yellowish brown tomentose; calyx 3, segments likewise tomentose, rotately spreading, ovate, united at the base, about 4 mm. long and nearly as wide below the middle; petals 6, subequal, free, rotately spreading, thickly coriaceous, velutinous; the outer 3 oblong usually a trifle larger, with rounded apices and broad bases, 8 mm. long by 4 mm. wide, the 3 inner ones narrower at the base and that portion arching over the sex organs in the bud state is glabrous; receptacle pitted, flattened, circular, finely hairy; stamens not numerous, unequal in length, 1.5 mm. long, the filamentous portion glabrous and subterete, the apical one half much enlarged into a subglobose mass with the anther cells apparently along its sides; pistils 2 mm. long, ovoidly linear, hairy except the short thick style and the slightly tipped and thickened stigma.

Type specimen number 14184, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected at the base of a 1000 feet high cliff in the narrow and wooded Catangan creek ravine at about 3500 feet altitude. The Manobos call it "Pamahogan."

Very close to *M. merrillii C. B. Rob.* (*M. ferruginea Merr.*) but our membranous leaves are glabrous except the midvein and lateral nerves and drying green on both sides; pubescence also lighter brown and much shorter and denser.

Mitrephora pictiflora Elm. n. sp.

Small erect tree; stem terete, 15 cm. thick, 7 m. high, straight, branched from the middle; wood yellowish white, odorless and tasteless, only moderately hard; bark smooth and greenish gray on surface, otherwise the color of the wood; main branches slender, divaricately spreading, repeatedly rebranched; the twigs terete, numerous, the slender apical portion ferrugineously pubescent, lax. Leaves subchartaceous, horizontal or descending, with very hairy bracts, slightly paler green beneath, greenish when dry, 10 to 14 cm. long by 3 to 4.5 cm. wide, occasionally much smaller, recurved toward the slenderly acuminate apex, margins entire, alternatingly scattered along all branchlets, oblongish or ovately oblong, glabrous except the nerves beneath, petiole 5 to 8 mm. long, thickened and subterete, usually with a pubescent bud in its axils, minutely ringed transversely, hairy but becoming glabrate; midvein bold beneath, with ferrugineus hairs on both sides, ultimately becoming glabrate; the 5 to 7 lateral pairs of nerves much ascending and curved, the tips of the upper ones usually united some 3 mm. below the edge, quite conspicuous beneath, reticulations dense and equally obscure from both sides. Flowers solitary or 2 or even 3-clustered from very short ferrugineus and few bracteate stalks, coming to anthesis at different times, odorless, pendant; pedicel recurved, yellowish green, slender, densely covered with ferrugineus hairs, 2 cm. long, subtended at the base by minute bracts, provided with a broad similarly colored and hairy bract at the middle or a trifle above it. Sepals 3, nearly free, ovate, spreading in anthesis, 4 mm. long, the margin and dorsal side densely covered with ferrugineus hairs, glabrous on the upper side; sepals 6, in 2 very unequal series, pale white or yellowish tinged and densely streaked and spotted with deep incarnatus, turning yellow when old, soft and deciduous; the outer 3 spreading, very rugosely twisted or folded, glabrous on the ventral and strigosely pubescent on the dorsal side, 2 cm. long and 1.25 cm. wide across the middle or above it, base only one third as wide, apex apiculate; the inner 3 overarching the pale yellow stamens and pistils, slenderly stipitate below the midde, the upper portion abruptly expanded; the expanded portion cuneate at base, acutely pointed at apex, subauriculately lobed, appressed on the back even so along the stipe, woolly hairy on the upper or ventral side; receptacle 3 mm. across, circular, hairy especially around the edge, much flattened; stamens many, early falling, 1 mm. long, mushroom-like, short or broad cuneate, the connective expanded into an oblique relatively large plate; the lateral anther cells yellowish white; pistils as many as stamens, columnar, 1 mm. long, hairy around the base, terminated by a glabrous reddish brown obscurely lobulate sessile minute stigma.

Type specimen number 13781, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in humus covered well drained soil of a densely forested ridge of Giwantanan at about 2500 feet altitude. "Babayocan" is the Manobo name.

Mitrephora aversa Elm. n. sp.

A very slender tree; stem 6 cm. thick and 8 m. high, terete and nearly straight, branched all along the middle; wood odorless and tasteless, yellowish tinged, moderately soft; bark smooth, gray on the surface, otherwise isabellinus; main branches divaricate; the twigs relatively short, lax, descending or horizontally spreading, glabrous or only the young tips slightly hairy, numerous. Leaves copious, similarly disposed, thinly coriaceous, alternate, entire, in the dry specimens dull brown on both sides, recurved toward the acuminate apex, base rounded or broadly obtuse, the bud leaves fulvus hairy, elliptic or oblong, elliptic, glabrous except the few scattering hairs along the midrib and principal nerves, the larger blades 1 dm. long and 3.5 cm. wide at the middle, the young ones very light green; midrib sparsely strigose beneath, the 5 or 6 lateral ascendingly curved nerves less prominent beneath, reticulations obscure; petiole 3 mm. long at most, very thick for its length, caniculate, strigose when young, ultimatley glabrous. Inflorescence nearly leaf-opposed; flowers usually few clustered, odorless, descending; pedicel rufus pubescent, 3 to 5 mm. long, subtended toward the base by unequal yet similarly pubescent bracts, arising from the distal end of a 5 to 8 mm. long peduncle; calyx 2 mm. wide, 1.5 mm. long, green, short or broadly ovate, united at the base and in anthesis rotately spreading, strigosely hairy on the outer side, pellucid punctate on the inner surface, persistent; petals 6, very unequal; the outer 3 similar to calyx segments, broadly ovate, 4.5 mm. long, fully as wide, recurved in anthesis, finely strigose on the back and on the apical portion of the inner side, also pellucid punctate, distinctly several veined, deciduous; the 3 inner petals erect and overarching the sex organs, ochraceus, 6 mm. long, the basal two thirds stipitate, expanded at the distal end into a 3 mm. wide rhombic lamina, subglabrous except the apical marginal pubescent region, punctate, thick and leathery; receptacle flattened, barely wider than 1 mm., bearing 6 pistillate flowers, hairy especially around the edge; ovary pale yellow, hairy, 1 dm. long, ovoid and compressed toward the apex on the ventral side, terminated by a darker colored subcapitate sessile stigma. Young fruits linearly elongated, 4 cm. in length, subterete, glaucous green and nearly glabrous.

Type specimen number 13985, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Found in loose well drained and humus covered ground of a steep forested ravine at 1250 feet altitude. "Pamohogan" in Manobo.

It is at a glance related to *Orophea unguiculata Elm.* The outer petals are too long to be classed under *Orophea*, yet the linear young fruits are more of an *Orophea* character than of a *Mitrephora*.

Mitrephora ellipanthoides Elm. n. sp.

A slender erect tree; stem 1 dm. thick, straight and terete, 8 m. high, branched from below the middle; wood soft, dingy white, odorless and tasteless; bark relatively thick, smooth, gray and brown mottled, yellowish brown otherwise; main branches divaricate, laxly rebranched, the twigs dark brown and rather tough, the ultimate ones very slender and cinereously puberulent. Leaves mostly descending, shallowly folded upon the upper glabrous surface, the sharp and slenderly acuminate apex recurved, based broadly obtuse or obtusely rounded, broadly lanceolate to narrowly oblong, entire, alternate along the twigs only, paler green beneath, drying deep brown on both sides, 3 by 10 cm. although frequently much smaller; midrib prominent and depper brown beneath, grooved along the upper side, in the early state finely pubescent, becoming glabrous; lateral nerves 7, very oblique, strongly curved, tips scarcly united, relatively, prominent beneath; petiole 3 mm. long, puberulous or subglabrous. Fruits lateral, ellipsoidly globose, hard, nearly flavovirens in color, 1.25 cm. in diameter, sessile, solitary or few clustered at the distal end of the thick 5 to 8 mm. long peduncle, the peduncle with an enlarged puberulent receptacle, finely creased along one side.

Type specimen number 13987, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in rather dry loose humus covered ground of a steep wooded ravine at 1500 feet altitude.

OROPHEA BLM.

Orophea palawanensis Elm. n. sp.

A small slender tree; stem 2 dm. thick, terete, 10 m. high; main branches divaricate, slender, forming an elongated crown from above the middle; twigs very slender, tough, horizontally spreading, only the young tips olivaceus pubescent; wood nearly sulphureus and turning blackish toward center, soft, odorless sweetish; bark grayish white mottled, smoothish, yellowish brown except the epidermis. Leaves submembranous, descending, very deep green above, much paler beneath, curing subequally brown on both sides, flat or only the abruptly acute to acuminate tips recurved; base broadly obtuse, the young ones densely covered beneath with olivaceus soft hairs, oblong, glabrous except the primary nerves beneath, quite variable in size, only the average ones 6 by 16 cm., the entire margins slightly involute at least in the dry state; midvein prominent and more or less hairy beneath, glabrous and shallowly grooved along the upper side; lateral nerves of 7 pairs, strongly ascending and curved toward their ends, also strigose, reticulations coarse and evident from beneath only; petiole nearly black even in the fresh state, terete and with a deep channel on the upper side, similarly pubescent at first, ultimately glabrous, very stout. Inflorescence axillary, all the stalks with calyx deep green and provided with blackish hairs which turn olivaceus upon drying, varying from 1 to 3 cm. long; peduncles 1 to 3-clustered, branched from below the middle, subtended by deciduous bracts; branchlets few, divaricate, subtended by similar pubescent bracts; flowers clustered toward the ends of the ultimate branchlets, subtended by bracteoles, faintly fragrant; calyx bristly reddish or blackish hairy, united at the base, deep green, triangularly acute, 2 mm. long or less, unequal in size; petals of 2 unequal series; the outer 3 sepal-like, green, cordately ovate, 3 mm. long, about as wide across the base, suberect, pubescent on the back, glabrate on the ventral side; the 3 inner petals caducous, thick but rather soft in texture, nearly viridis, clawed at the base, the middle portion somewhat constricted, the upper one half oblongish and rounded at the apex, the basal portion erect and overarching the stamens and pistils, otherwise strongly reflexed, rugose, roughened by numerous papillae, glabrate, 9 mm. long, 3.5 mm. wide, broadly linear; anthers not very numerous, 1 to 1.5 mm. long, subsessile, connective quite small and flattened at the base into a short stipe, the sacs well toward the apex of the dorsal side; pistils about as many as stamens, glabrous, shorter than 1 mm., curved, minutely apiculate, somewhat compressed.

Type specimen numbers 12858 and 12645, *A. D. E Elmer*, the former from Puerto Princesa (Mt. Pulgar), Palawan, March, 1911; the latter from Brooks Point (Addison Peak), Palawan, February, 1911.

The first number was discovered in good humus covered soil of densely forested slopes along the Balsahan river at 500 feet altitude; the latter in black more or less sand mixed soil in dense woods bordering a low somewhat swampy region at sea level.

If *Orophea*, nearest to *O. bracteata Merr.*

Orophea submaculata Elm. n. sp.

A slender erect tree; stem terete, 1 dm. thick, 8 m. high, the main branches from the middle; wood quite hard, odorless and tasteless, whitish on the outside, cremeus otherwise; bark dirty brown mottled when old, avellaneus except the smooth epidermis; branches few, scattered, slender, divaricate, only sparingly rebranched; twigs very slender, lax, usually drooping or subpendant, the young portion olivaceus hairy. Leaves alternate, scattering along the branchlets, horizontal, submembranous, the entire margins finely involute in the dry state at least, apex acute or bluntly acuminate, broadly obtuse or rounded at the base, oblong, quite variable in size, the 2 sides drying unequally brown, glabrous except the nerves beneath in the dry state, the larger ones 1 by 2 dm. although frequently much narrower; midrib bold, olivaceus puberulent, sunken and glabrous along the upper side; lateral pairs 9 to 11, much ascending and curved, tips anastomosing, the cross bars and reticulations relatively fine; petiole very thick, at least 5 mm. long, shallowly grooved along the upper side, olivaceus canescent but becoming glabrous when old. Flowers axillary, slightly fragrant, 1 to 3-clustered, descending; peduncle 5 mm. long, strict, provided with fuligineously hairy bracts, bearing flowers at its distal end; pedicels about as long, similarly pubescent and bracteate especially at the base; calyx ovately oblong, thick, spreading, olivaceus hairy on both sides, 3, subequal, more or less united at the base, 3 mm. long; petals easily falling, of very unequal series; the outer 3 sepal-like, 6 mm. long, only one half as wide across the middle or just below it, similar in texture, grayish and finer pubescent, ovately oblong, the margins toward the acute apex revolute in the dry state at least, equal in size; the inner segments submaculate, the basal one third clawed or stipitate, 7 mm. long, 4 mm. wide across the middle running to a blunt apex from the middle, the upper one half very thick and cushion-like on the upper surface, finely pubescent except the ventral portion below the middle; stamens about 12, circled about the basal portion of the pubescent receptacle; anthers brown in the dry state, 1 to 2 mm. long, curved, widened toward the subtruncate or apiculate apex; pistils several, 2 mm. long, clustered into an apical mass, densely hairy except the thinner glabrous stigmatic portion; young fruits elongated or linear, subterete, grayish hairy.

Type specimen numbers 13018 and 13099, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In moist soil of humid forests from 750 to 1500 feet altitude.

As to our Philippine species it is nearest to *O. maculata Merr.*

Orophea unguiculata Elm. n. sp.

A small and erect tree; stem terete, 10 cm. thick, 7 m. high, divaricately branched from below the middle; wood dingy white, maple grained, light, rather soft, odorless and without taste; bark brown, smooth, relatively thick; twigs slender, very lax, puberulent or the older portion glabrous. Leaves ample, alternating, entire, horizontally spreading or descending, flat, thinly coriaceous, glabrous except the midrib and larger nerves beneath, the slender acuminate or subcaudate apex recurved, obtusely rounded at base, the smaller one broadly lanceolate, the larger oblong and 14 cm. long by 4 cm. wide across the middle, curing brownish; midrib very sparingly strigose and rather bold beneath, the 6 to 9 lateral pairs ascendingly curved especially toward their tips and likewise conspicuous; petiole 5 mm. long or less, puberulent but soon wearing glabrous; reticulations fine yet quite conspicuous beneath at least. Flower subpendant, odorless, usually single but occasionally in pairs, quite rigid, deciduous, axillary or more frequently in the axils of the leaf scars; pedicel very slender, olivaceus puberulent, subtended at the base by a whorl of small similarly hairy bracts, bearing from above the middle a minute bract. Calyx united at the base, finely olivaceus pubescent on the back in the dry state, greenish when fresh, quite rigid, 2 mm. wide, less in length, ovately rounded; petals very unequal, the 3 outer ones similar to the 3 calyx lobes but by 2 mm. longer, pubescent on the back and glabrous on the inner surface, reflexed in anthesis; the inner 3 petals leathery; olivaceus puberulent on both sides, slenderly clawed, only the distal portion expanded into a 5 mm. wide and only one half as high lamina, the sides subauriculately extended, very bluntly pointed, in the bud state well overarching the sex organs, the claw is 4 to 5 mm. long and expanded toward the distal end; receptacle flatly conical, short ciliate, only 1 to 2 mm. across; flowers apparently all staminate, pale yellow, broadly cuneate, imbricate, not very numerous, angularly compressed, less than 1 mm. long, widest across the thickened truncate apical plate, the lateral anther cells relatively broad and much paler in color or subhyaline.

Type specimen number 13286, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Discovered in red compact moist ground along a forested ridge at 1500 feet altitude. Its Manobo name is "Papaon."

O. cumingiana Vid., in fact not distinguishable by the foliage but the flowers are quite different.

OXYMITRA Blm.

Oxymitra auriculata Elm. n. sp.

A tough woody climber; stem looping and twining, about 1.5 cm. thick, wiry, subterete, the whitish wood covered with smooth dark brown or nearly black bark; the main branches long, the free portions hanging; the twigs relatively short, usually curved, twisted or looped at the base, the young tips fulvus or testaceus pubescent. Leaves coriaceous, descending when old, flat or slightly recurved at he obtusely rounded apex, base shallowly auriculate, very dark green and glabrous above, subglabrous beneath even in the dry state, margin entire and subinvolute in the dry state, alternate, the young ones puberulent beneath but with edge glabrous, oblong, 8 to 12 cm. long, 3 to 4.5 cm. wide; petiole 5 mm. long or shorter, at first hairy, ultimately glabrous, relatively thick; midvein prominent beneath and grooved above, reddish brown and usually strigose on the nether side; lateral nerves 7 to 11 on each side, ascending, curved toward their ends, similar in prominence and vestiture beneath, the two lowermost pairs arising from near the base, cross bars minute and a trifle more evident from beneath. Flower pendant, axillary or lateral from the young twig portion, solitary; pedicel 5 mm. long, fuligineously pubescent, subtended by a similarly pubescent and rather thick bract; calyx green, tawny pubescent, rigid, rotately spreading, 5 mm. long, 4 mm. wide at the base, terminated by a conspicuous point; petals 6, in 2 very unequal series, pendant; the 3 outer petals leathery, ochraceus, winged or strongly angled in the bud state and somewhat twisted, 5 to 8 cm. long, 7 mm. wide, linear, gradually tapering to the subfalcate tip, midvein creased on the back and edged along the nether side, concavo-canvex at the rigid base, glabrous except the finely puberulent dorsal side in the young state, valvate in the bud state; inner 3 petals triangularly ovoid when young the slender tips adnate and 7 mm. long, the basal 4 mm. expanded and closely overaching the sex organs, glabrous, coriaceous; receptacles roundly flattened, pitted; stamens imbricate, numerous, 1.5 mm. long, one half as wide, narrowest toward the base, compressed, terminated by a thick flattened disk; the cells dorso-lateral, with 2 unequal pairs on each side, very pale yellow; pistils severally clustered in the center of the receptacle, linear, nearly 3 mm. long including the 1 to 1.5 mm. long stipitate clavate stigma, the linear ovary portion densely hairy.

Type specimen number 13586, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

This middle sized tree climber was collected in a humid forested flat at about 750 feet altitude. "Gawod" is the Manobo name.

Our longer flowers distinguish it from *O. paucinervia Merr.* Its closest affinity, however, is with my *O. urdanetensis* and from which it can be distinguished by its auriculately rounded leaf bases and by our young fruits not being so distinctly pointed; veins and nerves more pubescent beneath in our present species.

Oxymitra urdanetensis Elm. n. sp.

A wiry and scandent shrub; stem 2 cm. thick, crooked, looped occasionally, tough, branched toward the top and froming tangled masses; wood dingy white, odorless and tasteless; bark relatively thick, testaceus except the dark blackish brown smooth epidermis; main branches horizontal or drooping when free, crooked, rebranched, only young tips sparsely strigose. Leaves many, alternating along the branchlets, similarly spreading, the acute to acuminate apex recurved, shallowly folded upon the upper relatively dark green surface, subglaucous, beneath glabrous except the rufus very young ones, oblong or broadly lanceolate, rounded at the base, entire, the average ones 1 dm. long by 3 cm. wide, frequently much smaller; midrib stout, glabrous and yellowish from beneath, grooved above; lateral nerves 5 to 7 pairs, very oblique, tips becoming obsolete, prominent beneath and depressed on the upper surface, cross bars very closely set and similarly evident from both sides; petiole less than 5 mm. long, hairy in the groove along the upper side, otherwise glabrous at least when old. Infrutescence usually leaf opposed, upon a stout divaricate 1 cm. long more or less fulvus hairy or subglabrous peduncle; receptacle subglobose, 4 mm. thick, densely short hairy between the scars; larger fruits 2.5 cm. long, the basal one half stipitate, the 1 cm. long and 5 mm. thick ellipsoid fruits with a stout and relatively lohg apex, all parts similarly short fulvus pubescent but apparently upon maturity becoming glabrous.

Type specimen number 13946, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered this scandent shrub upon a small tree on a damp forested mountain slope of red soil at 4000 feet altitude or near the summit of Duros peak. "Talimaghat" in Manobo.

This is only a very small tree climber, reaching only fifteen feet above ground, while *O. auriculata Elm.* is a tall tree climber with a wider sprawling habit. For the sake of safe anchorage in the tall tree tops the twigs in the one have formed rigid loops about their support.

PHAEANTHUS H. et T.

Phaeanthus nigrescens Elm. n. sp.

Small tree; stem 15 cm. thick, 7 m. high, terete, branched from above the middle; wood soft, yellowish white, odorless, slightly bitter; bark smooth, dark brown, the middle portion yellow, the inside of the same color as the adjoining wood; main branches divaricate, slender, repeatedly branched, only the young terminal portion strigose, light lenticelled. Leaves alternatingly scattered along the branchlets, horizontal or subpendant, nearly flat except the sharp abruptly acute to acuminate recurved apex, submenbranous, very deep green above and appearing rugose, paler beneath, glabrous, plumb black on both sides when dry, largest blades 2 dm. long by 9 cm. at the middle or widest portion, base broadly obtuse or obtusely rounded, oblongish or subelliptic, frequently less than one half as large, entire margins finely rugose in the dry state; midvein also black, grooved above, stout beneath; lateral nerves 7 to 10 on each side, oblique, most strongly curved toward the faintly united tips, also conspicuous beneath, cross reticulations very fine and obscure; petiole 1 cm. long or less, broadly grooved along the upper side, sparsely strigose when young. Peduncle of infrutescence 3 to 5 cm. long or longer, pendant, opposite the leaves, brown or grayish, flexible, glabrous; receptacle flatly globose, 5 to 8 mm. in diameter, with large scars, the intervening spaces short hairy; fruits upon 2 cm. long stipes, 1.5 cm. long, 1 cm. thick, bluntly apiculate, obscurely creased along one side, tapering at the base, ellipsoid, hard and green, turning luteus, then incarnatus and finally shining black, all black in the dry state.

Type specimen number 13727, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

In well drained rather stony soil of a densely wooded depression at 3500 feet altitude, between the peaks of Duros and Cawilanan. "Dagaua" is the Manobo name.

Not certain as to the genus and may belong to *Unona Linn.*

POLYALTHIA Blm.

Polyalthia romblonensis Elm. n. sp.

A subscandent shrub; stem 5 cm. thick, repeatedly branched; branchlets lax, slender, somewhat drooping, tough, brown lenticelled, the young tips strigosely brown; wood odorless and tasteless, white, moderately hard and heavy, with conspicuous radial lines; bark very dark brown, roughened with minute lenticels. Leaves descending, chartaceous, nearly flat, much lighther green beneath, glabrous, lucid above even in the dry state, curing equally gray on both sides, apex gradually acute to acuminate, base rounded, entire, linearly oblong or broadly lanceolate, alternatingly scattered along the ultimate branches, the larger ones 1.5 dm. long, nearly 4 cm. wide at or a trifle below the middle, frequently smaller; midvein conspicuous beneath, faintly grooved on the upper surface; lateral nerves relatively obscure, 7 to 12 primary pairs, oblique, their ends united 3 to 5 mm. below the edge, reticulations equally visible from both sides; petiole thick, short, blackish brown, usually covered with some similarly colored hairs. Flowers usually leaf opposed, pendulous; pedicels very slender, glabrous or nearly so, brown, slightly thickened toward the thickened end, 3 cm. long, solitary or few clustered from short bracteate tubercles; calyx 3 mm. high, 4 mm. wide across the base, united about the base, broadly ovate, apex rather sharp, slightly pubescent and papillose, spreading; petals 6, similar, united at the base, one series a trifle shorter and ovately oblong rather than truly oblong, similarly roughened and strigose, the longer ones 1 cm. long by 4 mm. wide; torus subglabrous; anthers indefinite, flattened, 1.5 mm. long, the connective expanded into a smooth dark brown disk, the pollen sacs pale yellow and lateral; pistils about 18, shorter than the anthers, irregularly angular, canescent except the glabrate stigmatic portion; fruits composed of 9 seeds, subglobose, the entire cluster nearly 4 cm. across, short stipitate, the individual ones less than 1.25 cm. in diameter, smooth, shining vermillion red.

Type specimen number 12170, *A. D. E. Elmer*, Romblon Province of Capiz, Island of Romblon, March, 1910.

Gathered in fertile soil of bottom lands along a wooded creek at 50 feet altitude.

Near to *P. lanceolata Vid.* based upon *Cuming* 450 which to me appears very similar to *P. suberosa Hk.* et *Th.* At once distinguished by the much larger leaves, smaller segments of the flowers and by its larger fruits.

Polyalthia minutiflora Elm. n. sp.

A strictly erect shrub; stem 3 to 5 cm. thick, 3 to 4 m. high, terete, branched from below the middle; wood quite hard, odorless and tasteless, dingy white; bark ater and griseus mixed, smoothish, testaceus except the epidermis; branches divaricate, only 3 to 5 dm. long, numerously rebranched, scattered and forming an elongated crown; the twigs short and flexible, the young tips fulvus pubescent, terete, slender. Leaves alternate, scattered, lucid and deeper green above, drying avellaneus, margins entire and in the dry state curved upon the nether side, the sharply acuminate apex recurved, base rounded and slightly inequilateral and cordately notched, glabrous, very unequal in size, the larger ones 1 dm. long by 3.5 cm. wide at the middle, oblong, nervose on both sides; midrib furrowed along the upper side, upon the nether side ridged and in the young state fulvus especially toward the base; lateral nerves similarly sunken above and ridged beneath, oblique, 8 to 11 pairs, their ends united 5 mm. below the edge, reticulations quite evident from both sides; petioles short and thick, terete, densely ferrugineus pubescent. Flowers odorless, solitary or few clustered, terminal and leaf opposed or along the branchlets; pedicels purplish green, terete, brown when dry, usually hairy, slightly thickened toward the distal end, 1 cm. long, subtended by short bracts and inserted upon a short common stalk or peduncle; calyx rigid, more or less united at the base, sparsely ciliate or hairy on the back, otherwise glabrous, broadly ovate, apex sharply pointed, 2.5 mm. wide and long, purplish green, outer 3 petals spreading as the 3 calyx lobes, subelliptic, sharply acute to acuminate, 5 mm. long by one half as wide across the middle, glabrous except the edges toward the apex; the inner 3 erect and with the apical portion recurved, oblongish, a few mm. longer, about the same width, the dorsal side finely puberulent, all of the petals pale lividus; receptacle flattened, glabrous; anthers vinosus, 35, dark crusted at the apex, connective ridged along the ventral side and expanded laterally; pollen sacs on the entire dorsal side, 0.75 mm. long; pitils 7, subterete, 1 mm. long, adpressed hairy especially toward the base, apically clustered and exceeding the stamens; stigmas globose, 0.5 mm. in diameter, easily becoming detached, densely brown ciliate, lilacinus; fruits few to severally clustered, subglobose, becoming lividus, at most 7.5 mm. in diameter, very short stipitate.

Type specimen number 13055, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in rich leaf covered soil of slightly wooded flats more or less interspersed with grassy glens at about 250 feet altitude.

Right near to *P. pulgarense Elm.* of the same general region but flowers much smaller.

Polyalthia pulgarense Elm. n. sp.

Lax shrub; stem 3.5 cm. thick, 3 to 4 m. high, terete, crooked, branched from near the base; wood quite hard and brittle, odorless and tasteless, gradually changing from the stramineus sapwood to the dark melleus center, with conspicuous radial lines; branches few, slender, lax, horizontal or descending, the twigs dark brown hairy; bark smoothish, greenish to ater, testaceus beneath the epidermis. Leaves descending, flat, chartaceous, paler green beneath, somewhat recurved toward the sharp acuminate apex, alternatingly scattered, oblong or the smallest ones broadly lance shaped, base obtusely rounded, inequilateral and cordately notched, the normal ones 1 dm. long, 4 cm. wide across the middle, margins entire, strongly curved upon the lower side in the upper side even in the dry state, nervosely wrinkled on both surfaces; midvein deeply grooved along the upper side, stoutly ridged beneath; lateral nerves 7 to 9 pairs, similarly ridged beneath and sunken above, ascending, their margins more or less united, 5 from the edge, reticulations very coarse and evident from beneath only; petiole short and thick, terete, olivaceous pubescent when young, ultimately glabrate. Flowers odorless, lateral or opposite the leaves, pendulous, usually solitary; pedicel terete, 1 cm. long, subtended by minute bracts, brown, finally glabrous, usually inserted upon a short common stalk; calyx composed of 3 persistent lobes, thick, spreading, united at the base, very sparsely hairy especially along the edges, ovately triangular, the apex sharply pointed, green; corolla segments thick, glabrous, in 2 very unequal series, deep purpurascent on tne inner sides, the outer median region tinged with green; the outer whorl of 3 spreading, suborbicular, the apex broad yet sharply pointed, 5 mm. across; the inner series oblong, acute at apex, 1.25 cm. long and 5 mm. wide across the middle, erect from the base to the middle, the apical one half recurved, receptacle flattish and glabrous; anthers numerous, 1.25 mm. long, nearly 1 mm. wide across the flattened crust, connective ridged along the ventral side, pollen sacs on the dorsal side from below the crust nearly to the base; pistils 9, grouped at the apex and extending beyond the stamens; style 1.5 mm. long, obscurely compressed, tapering from thickened base to the apex, adpressed hairy; stigma subglobose or slightly obovoidly angular, 0.75 mm. across, easily becoming detached, finely rugose or papillose.

Type specimen number 13100, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Only one shrub of this fine species was seen in very damp earth upon a crest of a very densely wooded stream cut at 1500 feet altitude.

As to our other Philippine species it is nearest related to *Phaeanthus acuminatus Merr.* from Mindoro; it is also quite distinct from *Polyalthia dumosa King* of Perak.

Polyalthia nickersonii Elm. n. sp.

A rather small erect tree; stem 2.5 dm. thick, 8 m. high, terete except the wadded base, branched from below the middle; main branches many, divaricate, very long, forming an elongated crown, freely rebranched; twigs relatively short, suberect, lax, the young tips densely yellowish puberulent canescent; wood light, soft, sulphureus except the thin whitish sapwood, odorless, distinctly bitter; bark relatively thick, mottled, smooth or roughened with lenticels or excrescences. Leaves alternating, mostly toward the ends of the twigs, chartaceous, glabrous, horizontal, entire, bluntly obtuse to acute at recurved apex, base truncately rounded and occasionally subcordate, duller green on the upper surface, when dry fuligineus above and umbrinus beneath, oblong, 3 dm. long by 1 dm. wide or a trifle wider, occasionally longer or much smaller; midrib prominently raised beneath, when young olivaceus pubescent, flat on the upper side and in the early state densely canescent; lateral nerves at first similarly pubescent, ultimately glabrous, 15 to 25 pairs, very oblique, tips ascendingly curved but scarcely united, cross bars rather numerous and very minute; petiole less than 1 cm. long, thick, terete, densely yellowish puberulent; buds densely short yellowish pubescent. Flowers usually axillary from the lowermost leaves or lateral, upon short densely canescent bracteate peduncles; calyx broadly shouldered at the united base; its segments 3, glabrous on the upper side, canescent or felty on the outside, broadly ovate, apex broadly obtuse, 1 cm. high or higher, 1.5 cm. wide across the base, outer petals 6 cm. long, 1.5 cm. wide, minutely pubescent, glabrous in the middle region toward the base, bluntly obtuse at apex, base broad, oblong or linearly oblong, yellowish, straight, succulent; the 3 inner lobes with a strong bend at the slightly constricted middle region, somewhat shorter and narrower, canescent except the flat basal portion, the middle and also the upper portion folded; torus flattish, soft and short hairy; anthers numerous , contiguous, 4 mm. long. the basal 1 mm. stipitate, it as well as the connective grayish white strigose, lobulately thickened at the apex, pollen sacs lateral and quite broad; pistils much less numerous, 1 mm. shorter, angular, grayish white strigose along the edges especially toward the stigmas.

Type specimen number 12852, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in sand gravelly soil of secondary forests upon the banks of the Balsahan river at 250 feet altitude. Dedicated to *Lieut. Bert E. Nickerson* in remembrance of his kind favors shown me while I was at Brooks Point.

Polyalthia mindanaensis Elm. n. sp.

Tree of a small stature; stem 10 m. high, 2 dm. thick, with main branches arising from above the middle; bark smooth, brown, mottled on the banches; wood soft, the thin sapwood whitish, otherwise yellowish, without odor or taste; branchlets divaricately spreading and freely rebranched; twigs furrowed, coarsely brown lenticelled, the young tips densely puberulent. Leaves glabrous at least when old, 3 to 4 dm. long, 10 to 13 cm. wide, oblong, apex obtuse, base broadly rounded or truncately so, the entire margins minutely involute when dry, horizontal, flat, chartaceous, deep green and lucid above, much paler beneath, few, alternatingly scattered toward the ends of the branclets, umbrinus in the dry state; midrib very stout and subglabrous beneath, nearly flat above; lateral nerves 20 to 25 pairs, also conspicuous, ascending, their tips ascendingly curved but scarcely united, reticulations fine and more evident from beneath; petiole 1 cm. long, very thick, glabrate at least the old ones or the upper flattened portion densely puberulent. Flower upon 2.5 cm. long thick pedicel, axillary or lateral, solitary; calyx thick, united at the base in a short cup, the 3 segments broadly obtuse, 1.5 cm. wide at the base, 1 cm. high, densely canescent, glabrous on the upper surface, subpersistent; petals more or less erect, subequal; the outer 3 bluntly oblong, 3.5 mm. long, 1.75 mm. wide across the middle, yellowish tomentose except the middle and basal upper portion; the inner 3 lobes a trifle shorter and narrower, felt-like on the outer side, only sparsely so on the ventral side especially toward the base; receptacle short conical, finely hairy; anthers 3.5 mm. long, compressed, the connective brown in the dry state and broadly crusted at the apex, the anther sacs wide and along the lateral edges; fruits short ellipsoid, apex rounded, at least 2.5 cm. long, hard, in the the younger state covered with a dense dull brown felt-like puberulence, ultimately hard and glabrate, upon a stout 7.5 mm. long pedicel, the torus 1.5 cm. across.

Type specimen number 11642, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

In fertile moist humus covered soil of dense forests at 4000 feet altitude. "Poogan" is the Bagobo name.

This species is only critically distinguished from *P. klemmei Elm.* and indeed both of them may be interpreted as mere varieties or even forms of *P. nickersonii Elm.*

Polyalthia klemmei Elm. n. sp.

Small erect tree; stem 1.5 dm. thick, 7 m. high, terete; its main branches from below the middle, divaricate, freely rebranched, the ultimate ones slender and lax; wood moderately soft, odorless and tasteless, yellow except the thin sapwood, grained somewhat like maple wood; bark smooth, brown and gray mottled; the young twigs sparsely pubescent. Leaves alternatingly scattered toward the ends of the branchlets, chartaceous, horizontally spreading, flat, much paler green beneath, glabrous except the nerves beneath, apex obtuse, truncately rounded, oblong, entire, 2 to 3 dm. long by 1 dm. wide, the 2 sides drying slightly unequally brown; midrib stout and strongly ridged beneath, also hairy, becoming glabrate, the upper flat side at first also covered with a dense tomentum; nerves about 20 pairs, yellowish, ascending, comparatively conspicuous, tips ascendingly curved but scarcely united, also hairy when young, cross bars fine but very obscure; petiole ascendingly curved, yellowish brown, finely pubescent, thick, the upper side flattened; buds covered with a dense fuligineus tomentum. Flowers fragrant, pendant, solitary and mostly from the lower leaf axils, upon short thick canescently bracteate stalks; calyx green, thick, united below the middle into a broad base; its 3 segments broadly ovate, almost 1.5 cm. broad at the base and 1 cm. high, puberulent on the outside, otherwise glabrous, apex obtusely rounded, spreading; petals also thick, creamy white, subequal, 4 cm. long, 1.5 cm. wide, rounded or obtuse at apex, all straight and nearly flat, shallowly constricted in the middle portion or a trifle below it especially the inner 3, all canescent except the basal upper surface; receptacle flattish, finely ciliate; anthers very numerous, short stipitate, 3 mm. long, compressed, the glabrous connective brown crusted at the apex, sacs lateral; pistils fewer, angular, one half as long as the anthers, canescent; fruits dark green and minutely yellowish green spotted, 2.25 cm. long, ellipsoid, apiculate, covered with a yellowish brown tomentum, the base constricted into a 5 to 8 mm. long stout pedicel, with a thin exocarp; torus nearly 1 cm. across, flattish globose or very much smaller and irregular in shape, tomentose except the large circular scars of the fallen pedicels.

Type specimen numbers 12565 and 12644, *A. D. E. Elmer*, the former from Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910; the latter from Brooks Point (Addison Peak), Palawan, February, 1911.

The Sibuyan specimens were gathered along a small stream of scattered woods at 250 feet altitude; the Palawan material in sandy soil mixed with fine gravel in woods bordering a swamp back of the seacoast forests. The Tagbanuas on Palawan call it "Alismat."

The foliage of this species is identical with that of the two preceding species, but the flowers exhibit specific differences. Named after *Mr. W. Klemme* who first collected it in the province of Cagayan, Luzon, June, 1906. See Forestry Bureau number 4289.

Polyalthia pinnatinervia Elm. n. sp.

Small and erect tree; stem terete and straight, 2 dm. thick, 7 m. high or higher, chiefly branched toward the top; wood soft, yellowish white, light in weight, odorless and tasteless; bark thick, smooth, testaceus except the greenish brown epidermis; branches spreading, rebranched, the ultimate ones relatively short; short bud densely umbrinus pubescent especially at the young ends, quite thick and rigid. Leaves alternate, the entire margins subinvolute when dry, subchartaceous, horizontally spreading, sublucid and glabrous on the upper surface except along the midrib, paler and duller upon the subglabrous lower sides, drying unequally brown, the young ones densely umbrinus tomentose beneath, varying from 1.5 to 2.5 dm. long, 5 to 8 cm. wide in the middle region, apex recurved, base rounded or broadly obtuse; midrib very stout beneath, yellowish brown puberulent on both side of the blade; lateral nerves pinnate also prominent and only sparsely strigose beneath, tips much ascending and united, 14 to 18 pairs, cross reticulations quite conspicuous but not so from the upper side; petiole 1 cm. long, olivaceus tomentose, nearly 4 mm. thick, fluted along the upper flat side. Flowers and young fruits in small clusters from the stem only, arising from gnarly woody tubercles, soft avellaneus tomentose throughout; peduncle 2 cm. long, terete, 3 mm. thick, slightly thickened toward the distal ends, densely umbrinus tomentose, straight or curved, subtended at the base by a whorl of rigid rather acutely pointed externally pubescent and unequal bracts; receptacle nearly 1 cm. across, avellaneus pubescent; calyx whitish, rigidly coriaceous, the 3 broadly ovate segments united toward the base, abruptly acute to acuminate, 1 cm. long by 1 cm. wide across the base, subglabrous on the inner side; the 6 petals similar, deep cremeus, very thick; inner 3 more archingly curved toward the apex, elongated, 5 cm. long, 1 cm. wide except at the slightly narrowed middle portion, the outer exposed side umbrinus puberulent; the outer 3 segments as long but twice as wide, all broad at the base and shallowly notched, apex obtuse or obtusely rounded, umbrinus pubescent on the exterior only; receptacle flatly conical, 1 cm. wide, densely umbrinus hairy; stamens numerous, caducous, imbricate, 4 mm. long; connective stipitate and 1 mm. long, extending clear through upon the dorsal side, disk-like and expanded at the distal end which usually is puberulent; anthers laterally dehiscent, 0.75 mm. wide; pistils less numerous, 3 mm. long, crowded in a circular terminal mass, elongated or linear, ciliately hairy. Young fruit avellaneus pubescent, ellipsoid, 1.5 cm. long, pointed, the stipitate basal portion about as long.

Type specimen number 13611, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered in a stony but very wet soil of a deeply shaded depression near a stream between Duros and Cawilanan peaks at 3500 feet altitude. "Tayaning" in Manobo.

Very near to *P. nickersonii Elm.* but leaf reticulations on nether side not wholly glabrous; young twigs, petiole and inflorescence woolly pubescent.

Polyalthia urdanetensis Elm. n. sp.

A slender erect small tree; stem 8 cm. thick, 7 m. high, straight, branched from above the middle; wood rather soft, dingy white, odorless and without taste; bark smooth and mottled, latericius except the epidermis; main branches scattered horizontally, rebranched; twigs lax, lenticelled, the young tips isabellinus hairy. Leaves similarly spreading or descending, subchartaceous to subcoriaceous, alternate, flat or only the entire marginal sides slightly curved upon the lower paler green surface, curing brownish, the nether side slightly strigose, apex acute to acuminate, base rounded, elongated oblong, the average ones 2 dm. long by 5 cm. wide at the middle; midrib very pronounced and strigose beneath, minutely verrucose on both sides; main lateral nerves about 8 on each side, with secondary intervening ones, likewise bold and strigose beneath, their tips truncately united or coarsely reticulated, reticulations rather coarse and very prominent from beneath only; petiole 3 to 5 mm. long, very thick in proportion, when young strigose but dark brown and glabrous in the dry and old leaves. Flower rigid, cremeus, odorless; pedicels pendulous, green, very slender, 5 to 8 cm. long, thickened at the distal end, subglabrous, subtended at the base by a few very unequal sharply pointed and hairy deciduous bracts, solitary, nearly opposite the uppermost leaves; calyx very rigid, rotately spreading, ovately rounded, subglabrous, 5 mm. wide and a trifle shorter in length, cremeus; petals likewise rigid and of the same color, yellowish green puberulent on the outer basal portion, 6, united about the base, well separating in anthesis, broadly obtuse, 1 cm. long by one half as wide, their basal portion concavo-convex, the 3 outer petals somewhat broader relatively and usually flat, the sides of the inner 3 curved upon the dorsal side; receptacle raised, the stamineal region smooth, the truncate portion pistillate; anthers 2 mm. long, 0.5 mm. wide, slenderly tapering from base to the much thickened nearly black flattened distal end, imbricate, the lighter colored anther cells very narrow; pistil 1.5 mm. long, densely hairy except the flattish nearly black and glabrous stigma. Receptacle of fruits 6 mm. thick, nearly glabrous; fruits purplish brown, 1 to 1.5 cm. across, ellipsoid or subglobose, hard, smooth, upon slender 3 cm. long glabrous pedicels.

Type specimen number 13931, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered upon a densely wooded ridge of Duros peak at 3500 feet altitude.

Flowers entirely too large to be classed with *P. romblonensis Elm.*

SACCOPETALUM Benn.

Saccopetalum arboreum Elm. n. sp.

Medium sized tree; stem straight or somewhat crooked, wadded toward the base, nearly 5 dm. through, 12 m. high or higher, branched above the middle; wood moderately hard, maple grained, beautifully splitting, yellow except the thin whitish sapwood, odorless and tasteless; bark very dull brown, scaling in thin plates, yellowish except the epidermis; branches few, the numerous short branchlets widely spreading, the fine twigs densely fulvus pubescent. Leaves pale green and more or less puberulent on both sides when young, glabrous when old and chartaceous, very lucid on the upper nearly flat side, turning brown when dry, ovately oblong or oblongish to subelliptic, when dry subinvolute along the entire margin, 1 dm. long, one half as wide, apex bluntly obtuse, base rounded and emarginate or subcordate; midvein quite prominent, glabrous on both sides; lateral nerves about 7 pairs, divaricate and with ascendingly curved tips which are scarcely united, also conspicuous beneath, reticulations coarse and evident from both sides; petiole very short, hairy when young, ultimately glabrate.

Flowers pendulous, axillary or along the branchlets; the short peduncle as well as the pedicels yellowish green and fulvus, the latter slender and 1.5 cm. long, both usually subtended by similarly pubescent bracts or bract vestiges; calyx pubescent, deflexed, of 6 nearly free segments; the longer sepals 7 mm. long, almost 2 mm. wide across the middle, linear or lanceolate, soft in texture, narrowed toward the base, apex obtuse, the other 3 oblongish and a few mm. long, deciduous; petals 3, caducous, their median line solidly purple, ovately oblong, 3 cm. long by 1.5 cm. wide below the middle, more or less clawed at the base, short olivaceus pubescent especially along the margins and blunt apex; receptacle ellipsoid, hairy; anthers about 25, loosely scattered about the lower one half, sessile, 1 mm. long, strongly curved ventrally or on the brown connective side, the anther sacs on the dorsal side are light yellow, the apical connective crust yellow; pistils numerous in an apical subglobose mass; styles 1.5 mm. long, somewhat compressed, tapering to both ends, pubescent, the subcapitate stigma also hairy.

Type specimen number 12677, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Only one tree was seen in dry soil of mixed forests on the trail leading out of Brooks Point to the north. "Ubaran" is the Tagbañua name.

Of this genus four species are known in eastern Asia, one in Australia and *S. longipes Vid.* in our archipelago.

UNONA Linn.

Unona miniata Elm. n. sp.

Erect undershrub; stem 3 to 5 cm. thick, 1 to 2 m. high or long, terete, usually branched from near the base; branches unbranched, spreading, tough; wood also tough, dry, whitish, without odor or taste; bark dark brown, smooth, easily peeling; twigs terete, the young tips fuligineus and finely puberulent, the old bark strongly crinkled in the dry state. Leaves alternate or more or less scattered in sub-whorls, flat, horizontally spreading, subchartaceous, much deeper and lucid green above, glabrous, 3 dm. long by 8 cm. wide above the middle, frequently much smaller and occasionally larger, margins entire and slightly involute in the dry state, curing isabellinus, oblanceolately oblong, apex gradually acuminate, the basal one half subpandurate, at the base auriculately cordate and 2 to 4 cm. wide; midvein prominently raised beneath, flat, on' the upper side in the early state brown pulverulent; lateral nerves 16 to 26 pairs according to size of the blade, ascendingly curved, also conspicuous, tips barely united, the basal ones short and rather faint, occasionally secondary ones are scattered in between the larger ones, reticulations minute and very obscure; petiole at first fuligineus canescent, very thick and glabrous ultimately, scarcely longer than 5 mm. Flower pendant, axillary, with a faint rather pleasant odor, succulent and rigid; the short pedicel whitish, glabrate at least when old, subtended by small bracts; calyx glabrous, subpersistent; segments nearly free, 3, ovate, flattened, 1.5 cm. long by 1 cm. wide toward the base, ochraceus, spreading; petals erect, rigid, nearly equal in shape and size, imbricately twisted to the right, varying from 3 to 5 cm. long or longer, from 5 to 10 mm. wide above the middle, oblanceolate, very smooth and leathery, edges rather sharp, usually somewhat narrowed below the middle, a trifle expanded at the base, tips obtuse or rounded, miniatus; anthers less than 2 mm. long, flattened, the crustaceous apex dull yellow, anther sacs on the dorsal side, connective ridged on the ventral side; receptacle densely hairy; pistils upon the apical portion of the receptacle, exceeding the stamens, contiguous; the styles hairy, the stigmatic portion thick glabrous and confluent; young infrutescence 2.5 cm. across, purple red, numerously seeded, the individual fruits are subglobose and upon similarly colored short pedicels.

Type specimen number 12718, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

Collected in moist rich soil of shruberries or light woods between the cogon field and the forested swampy belt near the coast.

Similar to but not the same as *U. rubra Merr.* from Balabac.

Unona palawanensis Elm. n. sp.

Lax shrub; stem subterete, nearly 5 cm. thick, branched from near the base; wood without odor or taste maple grained, moderately soft, yellowish white; bark smooth and gray from the outside, the inner side yellowish, with a green hypodermis; branchlets not numerous, lax, somewhat drooping, smooth and yellowish gray except the young twigs which are densely olivaceus pubescent and yellowish lenticelled. Leaves alternatingly scattered along the branchlets, diverse in size, subcoriaceous, horizontal or descending when old, the obtuse or acute tips recurved, the entire margins wavy, deep green on the upper glabrous surface, paler and scantily pubescent beneath in the young state, ultimately glabrous, oblong, rounded at the base, the larger blades 17.5 cm. long by 6 cm. wide across the middle; midvein very conspicuous beneath and pubescent, glabrous above; lateral nerves 7 to 9 pairs, ascending, tips anastomosing, the smaller ones also finely pubescent, reticulations and cross bars coarse and faint; petiole 5 to 8 mm. long, stout, densely covered with soft olivaceus hairs. Flowers odorless, solitary from the leaf axil, pendant; pedicel quite stout, terete, 7.5 mm. long, similarly pubescent; calyx ciliate, broadly ovate, the 3 segments 4 mm. broad at the base, 3 mm. long, more or less united at the base and glabrous on the upper side; corolla segments 6, equal, easily falling, leathery, ovately oblong, 1 cm. long, 6 mm. wide across the middle or below it, obtuse at apex, the outher 3 pubescent on both sides, the inner 3 glabrous on the upper side below the middle and also somewhat constricted toward the base; receptacle more or less hairy; anthers many, easily separating, compressed, cuneate, sessile or frequently very short stipitate, connective ridged on the ventral side toward the apex, plaited at the top, pollen sacs on the dorsal lateral side, 2 mm. long; pistils constiguous forming a subglobose apical mass, the stylar portion densely hairy; fruit terete, stipitate, olivaceus pubescent, dark green, short and ellipsoid, or longer and irregularly constricted, 2 cm. long, 1 cm. thick.

Type specimen number 13125, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in red clay with a gravelly subsoil of wooded river banks at 250 feet altitude.

Unona agusanensis Elm. n. sp.

Small slender erect tree; stem 14 cm. thick, 7 m. high, only branched toward the top; wood soft, white, a trifle sweet, odorless; bark smooth, grayish white mottled, green beneath the epidermis, otherwise of the wood color; main branches divaricately spreading, repeatedly rebranched; twigs green, glabrous or only the young tips finely pubescent, curing blackish. Leaves descending, submembranous, equally green on both sides but shining above, turning greenish brown upon drying, glabrous, alternatingly scattered along the younger branchlets, ovately oblong or merely oblong, the entire margins slightly recurved in the dry state, the acute to acuminate apex recurved, base rounded or broadly obtuse and frequently a trifle inequilateral, the larger blades 15 cm. long by 5.5 cm. wide below the middle; petiole blackish brown, widely caniculate along the upper side, less than 5 mm. long; midrib brown and edged beneath, only shallowly grooved along the upper side; lateral nerves 7 to 9 pairs, ascendingly curved, similar in color and prominence on the nether side, tips obscurely united, also glabrous in the mature leaves, reticulations fine and rather more evident from the upper surface. Flowers pendant, solitary or 2 to 3-clustered at the ends of short lateral branchlets; peduncle thick, 2.5 cm. long or shorter, brown appressed pubescent but becoming nearly glabrous; receptacle of young infrutescence 1 cm. across, flat and circular, roughly pitted and short olivaceous pubescent; calyx thick, rigid, with a broad truncate base, yellowish green puberulent on the outside, glabrous on the inner, spreading or reflexed in anthesis, the 3 lobes broadly rounded, 5 mm. long, nearly as broad at the base; petals 6, caducous, ultimately spreading and their sides more or less curved upon the dorsal surface, yellow except the greenish base, leathery, elliptic except the narrowed base, glabrous the 3 outer ones 4 mm. long and 2.5 cm. wide at the middle, the 3 inner two thirds as large, veins obscure; receptacle flattened, 7.5 mm. across, hairless; stamens numerous, deciduous imbricate, a trifle longer than 1 mm., 0.75 mm. across the thickened truncate apex, the connective compressed and gradually narrowed toward the base, anther cells much lighter in color and lateral; pistils centrally grouped, fewer in number; the ovary part cylindric and obscurely striate, finely hairy, 1 mm. long; stigmatic portion subclavate, very dark brown, about as long. Young fruits ellipsoid, upon slender stipes, ultimately entirely glabrous.

Type specimen number 3654, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Collected in dry sand gravelly soil upon wooded banks of the Catangan creek at 500 feet altitude. "Lanotan" in Manobo.

Unona leytensis Elm. n. sp.

A scandent and sprwaling shrub; stem or main branches 2 cm. thick, terete, flexible or at least bendable, ultimately repeatedly branched; wood white, not hard but tough, pith brown, covered with smooth and brown bark; twigs tough, green, horizontal or drooping, the glabrous young portion turning black while drying. Leaves chartaceous, similarly spreading, lucid and shallowly conduplicate on the upper surface, paler and duller beneath, recurved toward the slenderly acuminate apex, the entire margins rugosely wavy glabrous, widely scattering alternatingly, draying dull green on both sides, oblong, base obtusely rounded, 2 to 2.5 dm. or much less in length, 6 to 8 cm. wide across the middle or a trifle above it, edges subinvolute in the dry state. Infrutescence hanging upon 8 cm. long green terminal stalks; receptacles flattish globose, green, 2.5 to 4 cm. across, hairless; pedicels slender, also green, terete, curved and spreading in all directions from the receptacle, curing black, unequal in length, the longer ones 2 dm., glabrous and smooth; fruits also green, subglobose or more elongated and ellipsoid in general, diverse in size and shape, the larger ones rugosely constricted transversely, 1 to 2 cm. wide or long, surface when dry black and minutely roughened, with 1 to 3 transverse seeds.

Type specimen number 13880, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in wet stony ground along banks of the Catangan creek at 1000 feet altitude, among densely jungled woods. The Manobos called it "Dumagatan."

Related to *Uvaria concava T.* and *B.* and unquestionably it is the same species as my number 7365 from Palo, Leyte, collected over six years ago. My Leyte plant was originally distributed as *Unona ebracteolata Presl.*

UVARIA LINN.

Uvaria subverrucosa Elm. n. sp.

A low liana-like climber; stem nearly 2 cm. thick, rather rigid yet bendable, terete; wood whitish, with a brown pith; bark smooth, dull dirty brown; twigs tough, brown, the young portion or tips very finely stellate puberulent, terete. Leaves alternatingly scattered along the crooked branchlets, harsh and verrucose especially beneath, drying unequally brown, oblong or subelliptic, entire, the abrupt sharply acute to acuminate apex recurved, obtusely rounded at base, diverse in size, the average ones 15 cm. long and 6 cm. wide across the base, the bud bracts isabellinus, densely stellate; petiole similar in vestiture, relatively thick, less than 5 mm. in length; midrib scaberulous especially along the bold nether side; the 7 to 9 lateral nerves strongly curved ascendingly especially toward their obscurely united ends, also conspicuous and subverrucose beneath, reticulations coarse and obscure. Flower odorless, subaxillary, in small clusters, green except the yellowish petals and creamy white anthers and darker or duller yellowish brown stigmas; pedicel unequal in length, averaging 5 mm. long, densely isabellinus tomentose, arising from a short common also stellately tomentose stalk, bracteated at about the middle; buds globose; calyx spreading, rigid, united except the broadly obtuse apical portion, puberulent or pubescent on the exterior, persistent, nearly 2 mm. long and as wide; petals 6 or occasionally 7, rigidly coriaceous, obovately elliptic, 5.5 mm. long, 3.5 mm. wide just above the middle, rounded or roundly obtuse at apex, quite broad from the base, puberulent on both sides, imbricately overlapping; receptacle flat and glabrous; stamens many, imbricate, the outer series sterile; the connective very broad from the base, 2.5 mm. long, the apical 1 mm. ovately pointed; anther cells along the edge from the base up to 1.5 mm. long, lighter yellow, relatively narrow; pistil 2.5 mm. long, linear, angularly compressed, grouped in the center of the receptacle, stellately pubescent and finely glandular, the somewhat rugosely lobed stigmatic portion glabrous.

Type specimen number 13274, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

This is not as rank and as tall a liana-like climber as my number 13273 which is true *U. scandens C. B. Rob.* Both of these numbers were collected in the same place along a wooded ridged at 1000 feet altitude. The smaller flowers and the subverrucose under leaf surface at once distinguish our plant from *Robinson's* species.

Uvaria nudistellata Elm. n. sp.

A middle sized tree climber; stem bendable, subterete, looping, 7.5 cm. thick, repeatedly branched toward the top; wood porous, odorless and tasteless or sweetish, dingy white, gradually turning reddish upon exposure, divided into several radial sections; bark thick, obscurely rugose, dirty brown or blackish, testaceus otherwise; branches long, repeatedly rebranched, tough, sprawling and forming interlaced masses, the free and glabrous ends pendant. Leaves also pendant, chartaceous, deep lucid green on the upper shallowly folded surface, apex obtuse or bluntly acute, the entire margins wavy and slightly recurved in the dry state, the young foliage much lighter green and more or less scurfy beneath, base obtusely rounded, curing dull green on both sides, subelliptic or oblong, the larger lamina 15 cm. long and 5.5 cm. wide across the middle or much smaller, alternatingly scattered; midrib ridged beneath, deeply grooved on the upper side, glabrous; lateral nerves 8 to 11 pairs, oblique, much less conspicuous and similar from both sides, tips ascendingly arched but scarcely united, reticulations obscure; petiole at least 5 mm. long, glabrous, rather thick, blackish brown. Buds ovoidly globose, roughened with groups of olivaceus hairs or bristles; flower solitary, terminal, pendant, odorless, 7 cm. across; stout pedicels less than 1 cm. long, severally bracteated toward the base; bracts acuminate, 5 mm. long, similarly dark brown pubescent; calyx entirely covering the buds, 1.5 cm. long, when young short fuligineus stellate pubescent, ultimately becoming nearly glabrate, bursting open into irregular parts nearly to the base, the upper side glabrate except toward the entire margins; petals 8, rotately spreading, imbricate, free, subequal, the larger ones 2.5 cm. long by nearly as wide above the middle, obovate, thick, the apical portion somewhat thinner and inwardly curved, fuligineously puberulent, ultimately glabrate, between ruber and purpureus in color; stamens indefinite, sessile, cuneate, the linear anther sacs along the edges, somewhat compressed, connective very thick, at the apex inwardly curved, 2.5 mm. long, melleus, forming the basal rounded mass; stigmatic portion ochraceus, forming the upper portion of the rounded central mass, a trifle longer than the anthers, rugose by many circular divisions; the styles contiguous, short but densely pubescent.

Type specimen number 13015, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Rooted in red ground with a gravelly subsoil along a densely wooded creek bank at 750 feet altitude.

Possibly *Uvaria* and quite similar to *U. stellata Merr.* based upon my number 6321 from middle Luzon.

Uvaria sibuyanensis Elm. n. sp.

Erect shrub; stem 7.5 cm. thick, 5 m. high, branched from below the middle; wood soft, dirty white, tasteless, with a distinct peppery odor, coarsely grained, sappy white; bark relatively thick, yellowish gray, dull brown beneath the epidermis; branches sparingly rebranched, widely spreading, the glabrous green tips suberect. Leaves alternatingly scattered, flat, horizontally spreading, coriaceous, very dark velvety green above, much paler or yellowish green beneath, the 2 sides curing unequally brown, glabrous, the entire margins subinvolute at least in the dry state, obovately oblong or the smaller ones subelliptic, apex abruptly terminated into a blunt acute point, base roundly obtuse, 3 dm. long by 12.5 cm. wide a trifle above the middle; midrib prominently raised beneath, deeply grooved along the upper surface; lateral nerves not prominent, with about 15 lateral pairs, usually with secondary nerves extending from the midrib toward the margin, divaricate, tips usually forked and irregularly united, reticulations very coarse; petiole very stout, glabrous, dark green, 1.5 cm. long, deeply channelled along the upper side. Infrutescence lateral or leaf opposed, glabrous; stalk stout, deep green, 2.5 cm. long; torus 1 cm. across; fruit short stipitate, fusiformly ellipsoid, pale cherry red.

Type specimen number 12322, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, April, 1910.

Collected in moist stony ground of woods along the Sinuban creek at 1000 feet altitude. The local Visayan called it "Lanitos."

Uvaria cardinales Elm. n. sp.

A scandent and sprawling shrub; branchlets terete, finely wrinkled in the dry state, glabrous or only the young tips brown hairy. Leaves alternate, chartaceous, varying from 1 to 2 dm. long, the average ones 8 cm. across the middle, entire, at the apex rounded or abruptly terminating into an obtuse or acute point; base cordately rounded, glabrous on the shining upper surface, somewhat hairy beneath but soon glabrate except the midvein, the small blades elliptic, the larger ones more oblong; midrib pronounced beneath, at first olivaceus hairy on the nether side, finally becoming glabrate and appearing as finely papillate, grooved along the upper side especially toward the base; lateral pairs 9 to 11 or even 13, ascendingly curved, tips strongly so but scarcely united, quite conspicuous beneath, reticulations also evident from the under side. Flowers mostly solitary, leaf opposed or either above or below the leaf; calyx saucer shaped and united toward the base, finely stellate pubescent on the outside, glabrate on the inner, rotately spreading, the 3 segments over 2 cm. long from the peduncle, one half as broad at the base, obtuse or acute at apex; peduncle terete, stout, about as long as the calyx, similarly pubescent; petals 6, cardinal red, subequal, oblong, 3 cm. long, 1.5 cm. broad, obtuse at apex, thick and broad at base, rigid, stellately puberulent on the exposed back, glabrate on the upper surface; torus large, the peripheral portion hairless, the flat central mass finely hairy along the interstices; anther numerous, contiguous, much compressed, 7 mm. long by 2 mm. wide, linear, the connective toward the apex blackish in the dry state and prominent, obliquely terminating; the pollen sacs laterally dehiscent along the entire length; pistils also numerous, contiguous, angularly terete, as long as the stamens, densely brown hairy except the thickened more or less angular or lobulate otherwise truncate stigmas.

Type specimen number 7317, *A. D. E. Elmer,* Sorsogon, Province of Sorsogon, Luzon, November, 1905.

Of the two closely related species of *U. ovalifolia Blm.* and *U. littoralis Blm.* it approaches more closely the latter, whose flowers are not known and as I remember the fruits on our specimens were quite different from that figured in *Blume's* plate.

XYLOPIA Linn.

Xylopia densifolia Elm. n. sp.

Tree; stem 3 dm. thick, 10 m. high, with its main branches arising from the middle and widely spreading; sapwood white, dingy or yellowish so in the center, barely odorous, tasteless, moderately hard; bark dull gray or brown, checked on the stem, smooth on the branches; branchlets numerous, the glabrous twigs comparatively short and usually recurved. Leaves copious, alternatingly scattered, the entire margins slightly recurved when dry, glabrous, lucid above and dull green while the under side is much paler and fumosus in the dry state, gradually tapering into the sharp acuminate point, base broadly obtuse, ovately oblong or broadly lanceolate, the larger blades are 5 cm. long by 2 cm. wide at or below the middle; midvein relatively prominent beneath; the 7 to 9 lateral pairs very obscure and coarsely branched, the coarse reticulations still less evident; petiole glabrous at all times, nearly black when dry, less than 5 mm. long. Flowers in small groups from the leaf axils or from the axils of the fallen leaves; common stalk very short and bracteate at the base or none; pedicels longer than the peduncles, also subtended by bracteoles, all densely covered with short fulvus hairs; calyx flat cup shaped, 3 mm. long, fully as wide, the 3 thick lobes united toward the base, ovate, similarly pubescent; the outer 3 petals 6 mm. long, thick, finely hairy, broadly lanceolate, apex obtusely rounded, 2.5 mm. wide below the middle; the inner 3 a trifle shorter, as wide across the truncate or slightly auriculately lobed basal portion, the basal 1 mm. clawed, less pubescent, the upper side below the middle overlaid with a fold; stamens about 30, easily separating from the receptacle, 1 mm. long, cuneate, much flattened, apex somewhat thickened and laterally expanded, sacs along the edges, pollen apparently large; pistils 3, style 1 mm. long, the angular and granular much enlarged stigma 1 mm. long; fruit upon short stout pedicels less than 1.25 cm. long, ellipsoid, hard, greenish brown, yellowish so when dry, with 1 to 3 seeds imbedded in a rather dry thick exocarp.

Type specimen number12471, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910.

Gathered in moist gravelly soil in woods fronting the Pauala river at 750 feet altitude.

Distinct from *Unona dehiscens Blco.* The same as *Sr. Garcia's* number 11 from Baler, collected in August, 1902.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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FOUR SCORE OF NEW PLANTS

by

A. D. E. Elmer

ANACARDIACEAE

Swintonia foxworthyi Elm. n. sp.

Large lofty trees; trunk 1 m. thick, 20 m. high, wadded toward the base, otherwise terete and straight, chiefly branched toward the top; wood only moderately hard, the sapwood white, slightly reddish tinged toward the center, odorless and tasteless, light in specific gravity, splitting straight generally fine for working purposes; bark isabellinus and smooth, reddish brown except the epidermis; main branches crooked, spreading, numerously rebranched; the lax greenish twigs erect, subterete, glabrous and in the dry state nearly black. Leaves opposite, subopposite or even alternate, similarly disposed, coriaceous, glabrous, shining deep green on the upper folded side, glaucous green beneath, the glaucous character likewise evident in the dry brown state, narrowly elliptic to oblong, variable in size, the larger blades upon our specimens 1.5 dm. long by 5 cm. wide across the middle, obtusely rounded at apex, broadly obtuse or similarly rounded at base, the smaller leaves 5 cm. long, entire; midrib very pronounced beneath, flat above, very smooth; lateral nerves 11 to 16 pairs, divaricate, tips becoming obsolete, strict, the fine reticulation much more evident from the upper surface; petiole 2 to 5 cm. long, smooth, drying black, subterete. Inflorescence erect, terminal or from the uppermost leaf axils, pale yellowish green, glabrous, profusely panicled, 1 to 1.5 dm. long, the lower peduncles subtended by small leaves, branched from below the middle; branchlets opposite, similarly rebranched; flowers pale yellowish green, few clustered at the ends of the ultimate very short branches; pedicels glabrous, 1 mm. long or less, in the early state subtended by bracts equalling it in length; the bracts are usually somewhat keeled and rather pointed, the margins sparsely ciliate, quite rigid; sepals glabrous, imbricate, 5, cup shaped, subequal, short elliptic or ovately so, coriaceous, 1.5 mm. long, very sparingly ciliate along the margins or finely punctate on the back, united at the very base; petals 5, equal, ascending, free, clawed at the base, 2 mm. long at least, 1.25 mm. wide across the middle, elliptic or obovately elliptic, rounded at apex; fertile stamens normally 5, alternating with the petals and inserted upon their very bases, erect or ascending, accompanied by a sessile outwardly recurved gland; filaments glabrous, 1 mm. long on an average, nearly straight; anther broadly elliptic, 0.5 mm. long, basifixed, notched at base and emarginate at apex; ovary very minute, sessile, conical, glabrous, terminated by a mere vestige of a point. Very young fruit elongated ellipsoid, glabrous, surrounded by the much enlarged corolla segments; wings unequal, oblong, 2 cm. long, at least 5 mm. wide at the middle, yellowish with purplish streaks toward the base but turning reddish brown when dry.

Type specimen numbers 12982 and 13155, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April and May, 1911.

Discovered in red compact soil in a humid wooded depression at about 2000 feet altitude. Named after *W. F. Foxworthy*, professor of forest botany in the College of Agriculture, Philippines University.

Apparently allied to *S. schwenkii Teyms.* of Malacca.

Semecarpus obtusata Elm. n. sp.

Erect and burly tree; trunk nearly 6 dm. thick, 12 m. high, its main branches arising from below the middle; wood not hard but tough, moderately light in weight, odorless and without taste, the outer few to several cm. pure white, the balance gradually changing into the roseus heartwood; bark thick, minutely checked on the griseus surface, otherwise latericius; branches suberect, rather long, crooked, rebranched toward the ends, coarsely lenticelled twigs quite rigid, ascending, numerous and forming dense masses, the young apical portion glabrous. Leaves likewise disposed, very rigidly chartaceous, curvingly folded upon the glabrous green and sublucid surface, glaucous green and minutely puberulent beneath except the yellowish veins, alternatingly clustered, usually toward the ends of the twigs or at the point of branching, obovately elliptic to oblongish, rounded at apex but occasionally obtuse, base broadly obtuse or more narrowly rounded than at the apex, the larger blades 9 cm. long by 4 cm. wide above the middle, frequently smaller, entire, curing grayish on both sides; midrib raised beneath, subglabrous, very shallow along the upper surface; the 5 to 8 lateral nerves divaricate, curved from the base, also prominent beneath, tips reticulately united, the reticulations numerous and quite evident from beneath only; petiole 1.5 cm. long, very thick, grayish white, caniculate along the upper side. Panicle profuse, bright shining green, terminal, erect, odorless, the young portion short olivaceus pubescent, averaging 1.5 dm. long and nearly as broad, the branches rebranched above the middle, the ultimate ones short and subtended by acute bracts; petiole at most 5 mm. long, soft pubescent, subtended by similarly hairy bracts; calyx subcinereous on the outside, saucer shaped, mostly united, the 5 short triangular teeth bluntly pointed; corolla cremeus and sprinkled with brown, globose in the bud state, rugulose especially toward the apex, adnate and nearly free, 4 mm. long, 2 mm. wide across the base, apex bluntly rounded and subhyaline, narrowly or ovately oblong, nearly free at the base, glabrous, coriaceous, veins rather numerous and evident; stamens free, inserted upon the thick ovary disk; filament 1 mm. long, subterete, pointed at apex, also glabrous; anther basifixed, heart shaped, 0.5 mm. across or long; exerted ovary densely yellowish hairy, flattish globose, 2 mm. across, set upon a thick pubescent disk; style 1.5 mm. long, very finely hairy, expanded toward the very short 2 or 3-forked stigma or when old parted and recurved with a puberulent flattened stigmatic disk; ovary yellowish green.

Type specimen number 13003, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Gathered from the wooded Iwahig river bank at about 500 feet elevation.

Foliage very similar to though flowers not the same as those of *S. paucinervia Merr.*

BURSERACEAE

Canarium palawanense Elm. n. sp.

Small erect tree; stem 1.5 dm. thick, terete, nearly straight, branched at the top; wood soft, light in weight, without odor or taste, silvery white except the isabellinus heartwood; bark rather thin, smooth and whitish on the outside, with a green hypodermis, the middle portion brown, the inner side sappy white; the main branches widely spreading, sparingly rebranched, the ultimate ones very slender, about 2 cm. thick, suberect at the leaf bearing fulvus tips. Leaves imparipinnate, alternate, horizontally spreading, the larger 1 m. long, the peduncle one fourth as long, more or less angled or subcompressed, densely fulvus, striate; stipule 1 to 2.5 cm. long, 1 cm. wide, oblong in general outline, usually broadest across the base or a trifle above it, laciniately cut all around the edge, fulvus puberulent but with age becoming glabrate; leaflets 7 to 13, opposite, the rachis very similar to the petiole except for the edge along the upper side toward the distal leaf terminated end, the average leaflets 18 cm. long by 7 cm. wide across the middle, frequently much smaller especially the basal ones, occasionally larger, abruptly and very slenderly acute or acuminate at the much recurved apex, base rounded or terminal leaflet broadly obtuse, margins minutely serrate, curing dark brown on both side, the old leaves glabrous upon the shallowly folded upper much deeper green surface, chartaceous, oblong or the 5 cm. long basal one ovate; petiolule 5 mm. long or twice as long, thickened toward the distal end, obscurely angled, the old ones gray and glabrous; midrib keeled beneath, fulvus along the impression on the upper side; lateral nerves 12 to 20 pairs divaricate, tips strongly ascending and usually united, bold beneath, reticulations minute yet very evident beneath; panicle terminal or from the uppermost leaf axils, ascendingly curved, much exceeding the foliage, 1 m. long or less; branches few, divaricate, similarly curved, the ultimate stalks short and bearing rather numerous flowers which are either sessile or short pedicelled, all subtended by caducous bracts even the branches and peduncle; calyx subsessile, subtended by a slenderly acuminate bract 5 mm. long and yellowish gray pubescent on the dorsal side only; sepals 3, free, ovately elliptic, 4 mm. long, 2.5 mm. wide across the base, densely tomentose on the outside; petals as many, also free, alternating with the sepals, similar in shape or more oblongish and more pointed at apex, the sides usually folded upon the ventral side, tips also inwardly curved or bent, the exposed back less tomentose but the overlapping margins glabrous or nearly so, base broad, subequal, the larger ones 6 mm. long and 4 mm. wide at the base; stamens 5, erect, arising from the sinuses of the cushion-like glabrous disk; filaments 2.5 mm. long, glabrous, expanded and flattened toward the base; anther ovoidly ellipsoid, shallowly cordate at base and obscurely mucronate at apex, 1.5 mm. long, 1 mm. wide, the cells dehiscing laterally; pistil absent.

Type specimen number 12889, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found in moist fertile humus covered ground of dense forests along the Napsan trail at 750 feet altitude.

As to our Philippine species it is nearest allied to my *C. laciniatum*.

CAPRIFOLIACEAE

Capparis turczaninowii Elm. n. sp.

A tall tree climber; stem looping, crooked, flexible, terete, 7 cm. thick; wood dirty white, porous, tasteless, with a turnip-like odor, pith deep brownish red; old bark thick, grayish white and smooth on the stem, spiny on the branches, green on the twigs. Leaves flat, horizontal, subchartaceous, glabrous, dark green above, much paler green and drying reddish brown beneath, the upper surface remainning greenish gray, elliptically elongated, obtusely rounded at base, broadly rounded at apex and terminated by an obscure point, entire, 2 to 2.5 dm. long by 9 cm. wide a trifle above the middle, alternately crowded or more scatering; midvein very stout beneath and narrowly caniculate on the upper side; the 7 to 9 lateral pairs equally plain on both sides, ascending, the upper ones much curved, all more or less united with their tips, reticulations more evident from the upper side than from the lower; petiole averaging 1.5 cm. long, dark brown when dry, subterete especially toward the base, glabrous, with a pair of blunt spines at their basal sides. Inflorescence divaricate or pendant, occasionally terminal but usually lateral, paniculately branched, 3 to 5 dm. long, glabrous and pale green, the peduncle subtended by a pair of rather sharp and somewhat recurved spines; branchlets very seldom rebranched, compressed and fluted especially toward the distal ends, long, bearing at the end few to several flowers; pedicels ascendingly curved, also compressed and fluted on the sides, glabrous, 2 cm. long, gradually thickened toward the much enlarged distal end; sepals 4, glabrous, at least 1.25 cm. long, 1 cm. wide, broadly elliptic, margins subhyaline, coriaceous, the outer 2 deeply concavo-convex, pulverulent on both sides, the inner ones nearly flat; petals deciduous, cremeus, also free and of an equal number, glabrous, imbricate and slightly inequilateral, obovately oblong, much thinner in texture, margins irregularly short fimbriate, as long as the sepals and nearly as wide above the middle; stamens also deciduous, numerous and strongly interlaced; filaments cremeus, 2.5 cm. long or longer, thread-like, glabrous, curvingly crooked; anther 0.75 mm. wide toward the base, 2 mm. long, narrowly oblong, truncately rounded at apex, base broadly so, attached to the finely pointed filaments on the back a trifle above the base; style yellow but incarnatus at the base, 4 cm. long, also glabrous, terete, much thicker than the filaments, subpersistent, bearing a relatively thick clavate. green stigmas.

Type specimen number 12720, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

Discovered this coarse *Capparis* in gravelly soil of a dry wooded flat near the seacoast. Named in honor of the late

Nicolaus Turczaninow, a Russian botanist.

Capparis mucronata Elm. n. sp.

A small tree climber or a straggling shrub; stem quite rigid, 2.5 cm. thick, terete, curved, only sparingly branched toward the top with sharp yet minute spines at the ends of the leaf scars; wood white, soft, quite odorless and tasteless, with a large watery white pith; bark yellowish green or gray, the hypodermis dark green, beneath this latericius, the inner side whitish; branches long, green, tough, the free dangling terminal portion very lax and gradually reduced in thickness. Leaves alternatingly scattered all along, pendant, coriaceous, pale green, glabrous, nearly flat, curing very unequal in color on the two sides, elliptically elongated, paler green beneath, lucid above even in the dry state, the entire margins curved upon the lower side, the average lamina 15 cm. long; by 5 cm. wide, broadly obtuse at base, rounded at apex and terminated by a mucronate point; petiole 1.5 cm. long, midrib stout and blackish brown, the 5 to 8 lateral nerves ascending, their distal ends curved and coarsely reticulately united, a trifle more prominent beneath, reticulations evident especially from the upper side. Panicle suberect, terminal, 2 dm. long and nearly as wide across the base; branches also sparse, divaricate, glabrous, flattened, 1 dm. long or less, flower bearing toward the distal end; pedicels 1 to 2 cm. long, likewise glabrous, subcompressed especially toward the distal end; buds hard, green, globose.

Type specimen number 13080, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in dry gravelly soil in jungled wooddy depressions of the cogonal along the Balsahan river at 50 feet altitude.

Between *C. oblongata Merr.* and *C. cumingii M.* and *R.* yet quite distinct from either.

CLETHRACEAE

Clethra pulgarense Elm. n. sp.

A low stocky tree or shrub-like; branches ascending, terete, rigid, covered with brown bark; ultimate twigs short, more or less angular, brown or when old grayish brown scurfy. Leaves ascendingly spreading, alternately crooked toward the distal end of the twigs, diverse in size but not in shaped, the larger blades 7 cm. long and 4 cm. wide above the middle, obtusely rounded or subcuneate at the base, rigidly chartaceous, the basal portion entire, otherwise finely serrate or serrately dentate, the tips of the serratures usually callous, hoary stellate on the darker green upper side which ultimately wears glabrous, lucid on the upper side, the young nether surface nearly fulvus short tomentose, in the old leaves cinereous on the same side, margins usually curved upon the lower side; midrib very bold beneath and grooved above, beneath similar in vestiture and in its change of color from the young to the old conditions; lateral nerves 9 to 11 pairs, also bold beneath and impressed above, ascending, slightly curved, tips rather prominently united near the margins, cross bars conspicuous beneath only; petiole 1 to 1.5 cm. long, very thick, upper side flattened and shallowly grooved, cinereously scurfy but finally glabrous and very rough otherwise. Inflorescence terminal, exceeding the foliage, averaging about 1 dm. long, composed of several alternatingly scattered spikes; spikes less in length, fulvus scurfy or stellately hairy, flower bearing from below the middle; pedicels divaricate or recurved, 5 mm. long or shorter, densely provided with hairs or scales, usually subtended by minute caducous bracts; calyx suberect, united at the base, 5 mm. long, the 5 segments imbricate, the inner ones a trifle smaller, truncate at base, triangularly oblong, 2.5 mm. wide at widest portion, rather thick and rigid, crisply hirsute on the outer side; petals glabrous, imbricately overlapping in the younger state, united toward the base, 6 mm. long, the expanded portion nearly as broad, narrowed toward the base into a broad claw, apex truncately rounded, veiny, apical margin more or less rugose; stamens normally 10, inserted upon the basal portion of the short corolla tube; filaments 3 mm. long, much expanded and flattened at the adnate base, glabrous; anther basifixed, 1 mm. long, truncate at both ends, the apical portion parted and the cells dehiscing laterally from the apex downwards; ovary flattish globose, ciliate; style glabrous, carnosus, 2 mm. long, terminated by the slightly thickened stigmas.

Type specimen number 13190, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in the low ligneous vegetation upon the summit of the mountain after which it is named.

Its general aspect is quite different from all other Philippine *Clethras*. Distributed under *C. obovatifolia* but that name is already occupied in a manuscript.

COMBRETACEAE

Terminalia copelandi Elm. n. sp.

Large trees; trunk 1 m. thick, round, toward 20 m. high; wood moderately tough and hard, light, sapwood whitish, otherwise brownish red, odorless and tasteless; bark rather thick and gray, otherwise reddish; branches chiefly at the top, freely and crookedly rebranched; twigs suberect, terete, that portion beneath the foliage thickened and obscurely nodulose, 1.5 to 2 cm. thick. Flowers ascending, nearly flat, subcoriaceous, the terminal among ones tinged with red and their edges curvingly folded upon the upper side, usually in seasonal whorls, sublucid above, paler green on the nether side, curing unequally brown on the sides, entire, cuneately obovate, very unequal in size, beneath only sparingly puberulent, apex broadly truncately rounded, base slightly panduriform, 2 to 3 dm. long by 8 to 10 cm. wide toward the apex, the smaller ones 5 cm. long; midrib stout and distinctly edged beneath, much darker brown in the dry state, flat on the upper surface; lateral nerves about 20 pairs, ascending, parallel, relatively prominent beneath, only their ends much curved and anastomosing, cross and double cross bars or reticulations quite evident from beneath; petiole 5 mm. long and nearly as thick. Inflorescent spikes arising in a subwhorl between the leaves, ascending or curvingly subpendant, 1 to 3 dm. long; rachis slender, flower bearing to within a few cm. from the base, short puberulent, yellowish green when fresh, drying yellowish brown; pedicels similar in color and vestiture, solitary and scattered, occasionally in pairs, divaricate, relatively slender, subtended by minute caducous bracts; calyx yellowish green, broadly cup shaped, glaucous, with occasional resin-like glands scattered over the exterior, valvate, rotately spreading in anthesis, nearly the basal one half united, the triangularly oblong 5 segments obtuse at apex and ciliately bearded on the basal ventral side; stamens 10, curvingly inflexed in the bud state; the glabrous filaments 3.5 mm. long, spreading and usually curved; anther pale yellow, oval or short and broad ellipsoid, versatile, the lateral cells well parted at the base, 0.5 mm. across; pistils not seen; the central portion occupied by few to several dense tufts of reddish brown straight hairs arising from the brown rugose and cushion-like fleshy membranes.

Type specimen number 12594, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Discovered at about 25 feet altitude along the coastal forests and indeed near a fertile swampy region. The natives or Tagbanuas of this region called it "Talisoi." Named with pleasure after *Dr. E. B. Copeland,* dean of the College of Agriculture, University of the Philippines.

Terminalia iwahigensis Elm. n. sp.

A medium sized erect tree; trunk 6 dm. thick, 12 m. high, branched from below the middle, terete; wood heavy, hard, extremely burly, odorless and nearly tasteless, the outer several cm. melleus, the balance or central portion fuligineus; bark 2 cm. thick, deeply checked longitudinally, dull brown on the stem, grayish on the branchlets, otherwise dull melleus; main branches divaricate, long, rather crooked, freely rebranched from the middle; twigs horizontal or descending, scattered along the upper side of the secondary branches, very short, usually in subwhorls of 3, glabrous, thickened at the ends by the dense leaf scars. Leaves ample, beautifully scattering from the ends of the twigs, regularly ascending and of nearly equal size, light green yet paler beneath, coriaceous, very shallowly folded on the upper sublucid surface, curing deep brown on both sides, ovate or ovately cuneate, the broadly cuneate base entire, otherwise subentire or very coarsely and shallowly crenate, apex broadly or cuneately rounded, the average 1 dm. long by 6 cm. wide above the middle, the smaller ones only 2 cm. long, falling when dry and leaving large rugose scars; midrib flat above, very bold beneath; lateral nerves 5 to 8 paris ascendingly curved from the midrib, their tips usually united; reticulations minute and obscure from both sides; petiole also glabrous, 2 cm. long, subterete, with a pair of gland marks above the middle and to which the lamina is decurrent. Flowering spikes arising between the whorls of leaves, similarly spreading, 5 to 7 cm. long, terete, gradually tapering, puberulent or ultimately glabrous, easily becoming detached, usually curved, sulphureus; flowers odorless, scattered, sessile, deciduous, the buds and perianth citrinus; petals subcoriaceous, broadly cup shaped, glabrous on the outside, woolly hairy on the inner surface, normally split into 5 segments but frequently divided into more, united around the base; teeth triangular, 3 mm. long, nearly as broad across the base, the nearly obsolete calyx grown to the basal portion of the corolla; stamens numerous, inserted upon the basal corolla portion, of different stages of maturity in the same flowers, inflexed in the bud; filaments whitish, subterete, glabrous, the outer or older ones 3 mm. long, slightly thinner toward the apex; anther deep yellow, broadly ellipsoid, basifixed, well parted at the apex, 0.75 mm. long; pistil wanting, with 5 cushion-like glands at the basal portion of the perianth segments and which bear dense tufts of whitish long woolly persistent hairs; ovary disk aurantiacus. Infrutescence descending, green, the slender spikes glabrous; nuts stubbily fusiform at both ends, terete, 3 to 5 cm. long, 2.5 cm. thick at the middle for the larger ones, its stony seed yellowish brown, green but ater upon drying.

Type specimen numbers 12998 for flower and 13241 for fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April and May respectively, 1911.

Both numbers were collected along the wooded banks in rather wet gravelly soil of the Iwahig river, the first at 500 feet altitude and the other at twice that elevation.

CONNARACEAE

Connarus erianthus Elm. n. sp.

A looping climber; stem 5 cm. thick, terete, bendable; wood latericius except the thin whitish sapwood, porous, odorless and tasteless; bark relatively very thick, atropurpureus except the minutely checked dull brown surface, the inner surface with a molasses colored juice; branches slender, somewhat drooping but with suberect tips, the young terminal portion densely testaceus woolly. Leaves 5 to 7-foliate, alternate, ascending, 1 to 3 dm. long, the terminal ones smaller, clothed with woolly hairs, thickened at the base; leaflet descending, subchartaceous, nearly flat, the acute to acuminate apex recurved, base rounded, shining and much deeper green on the upper side, curing dull brown or reddish so beneath, the young leaves densely covered on both sides by a latericius brown tomentum which soon wears off with age, entire, the average ones 1 dm. long by 3.5 cm. wide across the middle or in the larger ones above the middle, elliptic or the larger blades more obovately oblong and nearly twice as long; petiolule 5 mm. long, densely wool covered, very thick in proportion; midvein bold beneath, grooved above, ultimately entirely glabrous on both sides; lateral nerves 5 to 8 on each side, much ascending, also conspicuous beneath and quite evident from above, tips more or less united, minute reticulations very evident especially upon the nether side. Panicle erect, exceeding the foliage, densely erianthus, 1.5 dm. long, alternatingly branched from the base, basal branches longer, all rigid, ascending, rather numerously and shortly rebranched; pedicels about 5 mm. long, they as well as the branchlets subtended by bracts; flowers odorless, thick, early falling; calyx widely fusiform, nearly free; the 5 imbricate sepals erect, very thick, glabrous and black punctate on the inner side especially above the middle, oblong, nearly equal, apex blunt, reddish brown, woolly tomentose on the exposed outer portion, 6 mm. long, 2.5 mm. wide at the middle, the basal portion united; corolla forming a false tube 8 mm. long, free at the base and above the middle, widest across the middle and usually remaining adnate in this region, linear, 1.5 mm. wide, glandular especially above the middle, apex obtuse, strigose pubescent along the back, smooth on the ventral side toward the base, otherwise conspicuously pulverulent, sides usually rolled upon the upper surface; stamens 10; filaments strict, erect, glabrous, 4. mm. long or much less in length, united and forming a solid rim about the ovary; anther ovoidly ellipsoid, 0.75 mm. long, versatile, laterally dehiscent; ovary elliptically elongated, densely hairy, 1.5 mm. long; style 4 to 5 mm. long, sparsely hairy, tipped toward the apex, bearing an enlarged capitate stigma. Fruits or capsule flattish ellipsoid, 2.5 cm. long, creased, densely covered with fulvus woolly hairs.

Type specimen number 12877, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This sprawling shrub was discovered in jungled woods of rather hard stony soil near a dry stream bed at 250 feet above the sea.

Quite similar though distinct from *C. stellata Merr.* and *C. culionensis* of the same author.

Connarus palawanensis Elm. n. sp.

A climbing and sprawling shrub; stem terete, crooked, 5 cm. thick, bendable, chiefly branched at the top; wood soft, porous, reddish toward the center, bitterish, odorless, nearly white on the outside; bark thick, almost castaneus, densely covered with similarly colored lenticels, yellowish on the inner surface, the middle region molasses red brown; twigs reddish brown lenticelled, the young portion latericius short tomentose but ultimately becoming glabrous. Leaves alternating, descending, scattered along the tough branchlets, 1 to 1.5 dm. long or longer, 5-foliate; petiole brown on the dry specimens, 5 cm. long, curved and thickened at the base, glabrate; leaflets chartaceous, strongly folded, dark green except the nether side, entire, curing brown, glabrous, the lower ones smaller, the upper or larger blades 8 cm. long by 3 cm. wide, oblong, the smaller leaves ovately oblong, the recurved apex rather abruptly acute to acuminate, their points blunt, base rounded or broadly obtuse; petiole 5 mm. long, the terminal one 3 times as long, thickened portion finely rugose dark brown, subglabrous, midrib conspicuous beneath and deep reddish brown, impressed above; the 6 to 9 lateral nerves oblique, faint, tips ascending and usually archingly united, reticulations obscure. Young infrutescence terminal, suberect, 1.5 to 2 dm. long, paniculately branched from the base, short latericius tomentose in the early state, when old puberulent, the ultimate branches rather numerously short rebranched; pedicel thick, subvelutinous, 1 to 2 mm. long, articulate at the middle, subtended by blunt similarly hairy caducous bracts; sepals erect, rigid, 2 mm. long by 1 mm. wide at the base, triangularly acute, finely tomentose on the outside, valvate in the bud state; petals 5, erect, about 8 mm. long, 1.5 mm. wide, ligulate, puberulent on the outer side, apex roundly truncate or notched, occasionally gland punctate above the middle, the sides usually rolled upon the ventral surface; fertile stamens 5, also erect, alternating with an equal number of sterile ones; filaments of the fertile one 2 mm. long, subglabrous, equally thick throughout, those of the sterile ones setiform, about one third as long only, all united at the base into a glabrous rim about the basal portion of the ovary; anther basifixed, 0.5 mm. long, horseshoe shaped; ovary large, densely pubescent, ellipsoid, 2.5 mm. long; style a trifle shorter, pubescent toward the base, terminated at the apex by an expanded irregularly lobulate stigma. Fruit elongated, 2.5 cm. in length.

Type specimen number 12771, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in densely wooded alluvial soil near the Iwahig river at 500 feet above sea level.

Between *C mindanaensis Merr.* and *C. neurocalyx Planch.* yet specifically distinct from either.

Connarus balsahanensis Elm. n. sp.

A slender and erect undershrub; stem 2 to 3 cm. thick, crooked, 3 to 4 m. high; branches few from above the middle, slender, recurved or nearly straight, the young tips minutely puberulent, the branchlets densely lenticelled; wood tough, odorless, tasteless, white and with reddish streaks; bark nearly castaneus, finely checked, the middle zone yellowish, testaceus on the inside. Leaves few, widely scattered, alternate, divaricate and horizontally spreading, 3 to 5 dm. long, terete, glabrous, green, much thickened at the base; leaflets subchartaceous, similarly disposed, flat, duller green above, brown when dry or reddish brown on the nether side, glabrous, mostly acute at apex, broadly obtuse or rounded at base, oblong, the lower pairs usually a trifle smaller, entire, the average 2 dm. long by 6 cm. wide at the middle; midvein bold beneath, deeply furrowed above; lateral nerves also conspicuous beneath, the 7 to 10 pairs ascending, reticulately united at their ends, the cross bars and reticulations quite evident from the lower side; lateral petiolule terete, much thickened and finely rugose, 5 mm. long, inserted upon an expanded scar. Inflorescence erect, arranged in groups along branchlets; spikes solitary from the same point, greatly from 1 to 7 cm. in length, rigid; the larger ones short branched from near the base, short fulvus tomentose, subtended by similarly pubescent caducous bracts; the branches rather numerously rebranched toward their ends; pedicels short, relatively stout, subtended by bracteoles; calyx nearly flavo-virens, widely fusiform, coriaceous, the basal 2 mm. united and constricted, oblong or obscurely obovately oblong, apex obtusely rounded, finely ciliate along the margins and puberulent on the exposed back especially toward the base, 7 mm. long by 2 mm. wide, subequal, black glandular dotted, obscurely 1 to 3-ridged on the dorsal side; corolla white with a tinge of red, 7.5 mm. long, forming a sort of tube, 1.75 mm. wide at the middle region where the margins remain intact, free at the narrowed base, linearly oblong, veiny, apex roundly obtuse, densely black dotted in the upper membranous region; stamens 10; filaments similar in color, glabrous, more or less united about the base, the longer ones 5 mm. in length, the alternating intervening ones much shorter, all glabrous; anthers citrinus, 0.5 mm. long, horse-shoe shaped, lobed at the base, basifixed; ovary 2.5 mm. long, obovoidly oblique, pubescent; style thick, also hairy, about as long or shorter, with a dark green stigma.

Type specimen number 13083, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

It was collected in gravelly soil of light woods along the Balsahan river at about 50 feet altitude.

CONVOLVULACEAE

Argyreia purpuricarpa Elm. n. sp.

A shrubby climber; stem twining, numerously branched toward the top, terete, 2.5 cm. thick, flexible; wooddy tissue very soft, porous, without odor or taste, white except the reddish brown central mass; bark relatively thick, dull brown and scaling in dry irregular plates, fibrous, latericius except the epidermis; branchlets forming dense interlaced masses, smooth, yellowish brown and puberulent on the younger ones, the leaf bearing short tips densely cinereous and nearly erect. Leaves horizontal, alternatingly crowded, leathery, dark green above and strigose in the young state but soon bearing glabrous, elliptic or obovately elliptic, entire, broadly rounded at apex, base broadly obtuse or obtusely rounded, the large lamina, 12 cm. long by 7 cm. wide at the middle, frequently smaller, the nether side slenderly strigose at least in the younger leaves, very unequally brown on the two sides in the dry state; petiole 2 cm. long, oppressed pubescent, gradually thickened toward the base; midrib very prominent beneath especially toward the base, similarly canescent, glabrous and fluted on the upper leaf surface; lateral nerves 5 to 7 pairs, comparatively minute, ascending and gradually curved toward the distal ends, equally visible from both sides, reticulations none. Fruits ascending, solitary from the leaf axils; peduncle 1 cm. long at least, stout, subsulphureus pubescent, easily falling and leaving large excrescent scars, persistent, nearly lividus and glabrous on the inner side, covered externally with oppressed yellowish gray hairs, the outer of the 4 to 5 segments larger and a trifle thicker, 2 cm. long by 1.25 cm. wide below the middle or smaller, acute to acuminate, the short apical points frequently reflexed, ovate to ovately oblong, deeply concavo-convex at or below the middle; stipe thick, similarly hairy, strongly articulated at the base; carpel purpureus, glabrous, shining, centrally erect, leaving a large circular scar after falling, subglobose, at least 1 cm. across, normally 4-seeded; seeds 5 mm. long, compressed globose, ater, appearing slightly velvety, angled on the inner side and with a large scar at the basal ventral side.

Type specimen number 12777, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Overtopping and sprawling upon jungled woods along the wet stony Iwahig river bank at 750 feet elevation.

Erycibe lateraliflora Elm. n. sp.

A scandent and widely spreading shrub; stem terete, 7 cm. thick; wood cremeus throughout, soft, porous, odorless, distinctly sweet; bark thin, similar in color except the smooth grayish white epidermis; main branches long and freely rebranched, the ultimate ones lax and more or less drooping, terete, glabrous clear to the tips. Leaves alternate, scattered, smooth, glabrous at least in the old ones, descending, dark green above and paler green beneath, drying nearly similarly brown, apex abruptly acute to acuminately round pointed, base broadly obtuse or rounded, coriaceous or subchartaceous, entire, 11 cm. long without the petiole, 5 to 6 cm. wide at the middle, elliptic or oblongish; midrib quite prominent beneath, nearly flat above; lateral nerves 5 to 7 pairs, ascending, more prominent beneath, tips much curved and usually anastomosing; reticulations fine, obscure, more evident upon the nether side which is usually very minutely punctate; pistil nearly black, also glabrous, caniculate, 1.5 cm. long, usually curved. Inflorescence profuse along the branchlets, badius puberulent throughout; spikes racemose, solitary or more commonly clustered, varying from 1 to 5 cm. in length, occasionally from the leaf axils, the larger ones with few short branches toward the base, bracteate toward the distal ends; pedicels 5 to 8 mm. long, subtended by blunt caducous blackish brown bracts, a trifle enlarged and bract bearing toward their ends; the free portion of the calyx 2 mm. long, the basal one half united, rigidly coriaceous, imbricate, the 5 lobes broadly elliptic or rotund, ciliate along the margins and oppressed hairy on the back, the marginal portion much thinner; petals united at the base, 5, the thick oblongish adnate coriaceous back brown hirsutulose, extended into 2 divergent glabrous laminae; these laminae are 2 to 3 mm. long, rounded at the entire apex, oblongish, the 2 pairs frequently somewhat united at apex; stamens 5, sessile, alternate, inserted upon the fleshy rim around the throat of the corolla; anther yellowish, subglobose, 0.75 mm. wide and 0.5 mm. long, the 2 cells opening laterally; ovary ellipsoid, 2 mm. long, glabrous, terminated by the thick truncate short columnar stigma.

Type specimen number 12750, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in wet stony ground along a wooded creek bank at about 250 feet above sea level.

Most like some material from Perak and Penang.

Erycibe terminaliflora Elm. n. sp.

Scandent and tree climbing; stems terete, flexible, 3 cm. thick; wood soft, dingy or yellowish white, odorless or tasteless, divided into several irregular groups; bark smooth, dull brown, yellowish except the epidermis; branches slender, tough, light gray or brown, smooth or lenticelled, the young portion densely fulvus tomentulose. Leaves alternate, ovately elliptic, glabrous above, conduplicate, recurved toward the short acute or obtuse apex, base rounded, paler green on the nether side which in the young state is densely covered with an isabellinus tomentum, glabrous in the old leaves, the normal blades 7 cm. long, 3 cm. wide below the middle, the entire margins slightly involute at least when dry; petiole widely caniculate along the upper side, when young soft brown tomentose, when old glabrous, about 1 cm. long; midvein stout beneath, flat on the upper surface; lateral nerves obscure, 5 to 8 on each side, rather straight, divaricate or ascending, their tips archingly united, a trifle more evident from the upper surface, reticulations about as plain and coarse. Inflorescence erect, fulvus pubescent, slightly fragrant, arising from the uppermost alternating branches, subtended by reduced leaves, lower 5 cm. long, usually curved, rebranched from near the middle; the secondary branchlets relatively short, lower ones likewise subtended by foliaceous bracts; pedicels 5 to 8 mm. long or shorter, alternatingly clustered toward the distal end of the ultimate branchlets, subtended by small caducous similarly hairy bracts, calyx subglobose, rigid, coriaceous, imbricate, the 5 segments united at the base, broadly elliptic, 3.5 mm. long and nearly as wide, short tomentose on the outside, the margins of the inner ones ciliate; corolla yellowish white, almost 1 cm. long; the 5 segments imbricate and in the bud state slightly twisted, the basal portion united into a short broad tude, narrowed toward the base, the dorsal portion provided with a special ovately oblong hairy coriaceous adnate membrane, terminated by 2 much thinner and glabrous divaricate membrane; these membranes are 3 to 4 mm. long, about 1 mm. less in width and are usually truncate and more or less toothed or fimbriate along the margins; stamens 5, inflexed in the bud state, alternate with the segments and inserted upon the orifice of the corolla; filament smooth, much flattened, very short and broad; anthers basifixed, narrowly cordate at base, ovately acuminate, 1.5 mm. long, one half as wide across the base; ovary ovoidly ellipsoid, sessile, appressed pubescent, terminated by a glabrous hood-like stigma, well parted at the apex, apparently only 1-celled, the 4 ovules basal. Young fruit ellipsoid, similarly pubescent, with a pointed apex, 1 cm. long, terete, thick, subtended by the calyx.

Type specimen number 13221, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in shallow red soil with a deep gravelly subsoil along the wooded Iwahig river banks at 250 feet altitude.

To be compared with *E. luzonensis Merr.* and *E. expansa Wall.*

DICHAPETALACEAE

Dichapetalum olivaceum Elm. n. sp.

A scandent shrub; stem bendable, 3 cm. thick, terete, branched all along toward the top; wood very soft, porous, ochraceus especially in the center, odorless but with a slight though distinct sweet taste; bark murinus, rather thick, shallowly checked or fluted longitudinally, the hypodermis white, the inner surface exuding an ochraleucus somewhat viscid juice; branch s freely rebranched, lax, slender, smooth and ater brown, the green ultimate tips light olivaceus tomentulose. Leaves alternate, scattered, descending, chartaceous, deep lucid green above and glabrous in the old ones paler beneath, entire, curing brown or dull gray, obovate or obovately elliptic, apex short pointed, base broadly obtuse or subcuneate, the larger blades 8 cm. long by 3.5 cm. wide above the middle, soft, slightly olivaceus pubescent beneath even so in the old leaves; midrib made more evident by its dense pubescence, glabrous on both sides in the old leaves; lateral nerves 5 to 7 on a side, ascendingly curved, reticulately united, in the younger leaves similarly pubescent on both sides, reticulations fine and equally evident on both sides of the glabrous lamina; petiole 4 to 7 mm. long, at first densely light olivaceus, ultimately glabrous. Inflorescence yellowish green, erect, terminal or from the uppermost leaf axils; peduncle usually solitary, 2 to 3 cm. long, very light and densely olivaceus tomentose; divaricately branched at the end, branchlets again rebranched but very short, all more or less subtended by thick and caducous bracts; flowers odorless, quite easily falling; pedicel 1 to 2 mm. long, relatively thick, olivaceus tomentose, subtended by similarly hairy linear or laciniate bracts, easily breaking at about the middle; buds globose, olivaceus tomentose on the outer side, valvate, parting from apex to base into 5 subequal segments or sepals, the outer or longer ones 2.5 mm. in length, 1 mm. wide, oblong or elliptically so; petals 5, free, alternating with the sepals, 2.5 mm. long, obovately oblong or clawed toward the base, apex broadly rounded and either finely apiculate or obscurely emarginate, veiny, glabrous, suberect; fertile stamens 5, each with an accompanying abortive one, both inserted upon the base of the petal claw; filament 2 mm. long, glabrous, apparently somewhat dilated; anther 0.33 mm. across, oval or short ellipsoid, attached from the nearly black thick connective on the dorsal side; ovary small, deep woolly, the 1 mm. long erect style glabrous, stigma short forked.

Type specimen number 12919, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Gathered from the tops of trees standing in the red gravelly soil of the Iwahig river banks at 250 feet altitude.

Only critically distinguished from *D. benthaminanum (Turcz.) Engl.* and *D. luzoniense M.* and *R.*

DILLENIACEAE

Tetracera subrotundata Elm. n. sp.

Lofty tree climber; stem looping, terete but very crooked, 5 cm. thick, flexible, very porous and with radial lines, without taste and odor, dingy white except the testaceus heartwood; bark yellowish on the inner side, hypodermis latericius, the surface exactly fulvus and scaling or flaking in thin plates, with a clear sap; twigs tough, crookedly curved, tips ascending, hanging in tangled masses, pulverulent, striate. Leaves alternating, horizontal or descending, shining deep green above and obscurely conduplicate, paler beneath, subglabrous on both sides, curing brown, very chartaceous, elliptic or subrotund, harsher on the nether side, both ends broadly rounded, the apex usually very short blunt pointed' margins entire or toward the apex very obscurely crenate, the average lamina 14 cm. long by 8 cm. across the middle or its widest part; midrib flat on the upper leaf surface, prominent and sparsely hairy beneath; lateral nerves less prominent but equally strigose, oblique, parallel, only the very tips ascendingly curved, the very numerous cross bars barely visible; petiole 2 cm. long, conspicuously channelled along the upper side, usually appressed hairy. Inflorescence terminal, erect or suberect, green and sparsely puberulent or subglabrous, much exceeding the foliage, distichously rebranched and forming a dense elongated panicle; branches alternate, the basal ones longer and usually subtended by a foliaceous bract, rebranched from near the base, all the stalks angularly compressed, the ultimate ones subtended by bracts; pedicels less than 5 mm. long, distinctly articulate above the middle; flower sweetly odorous; sepals green, of 2 unequal decussate pairs, elliptic or obovately so, finely ciliate along the margins, deeply concavo-convex, conspicuously reticulate, the smaller pair 4 mm. long, the larger by 2 mm. longer, the broad bases united into a concrete mass, widely separated when in full flower; petals cremeus, often lacking or occasionally with an obovately linear appendage 6 mm. in length, deciduous; stamens very numerous, well interlaced, inserted upon the pseudorim at the base of the calyx segments; filaments filiform, glabrous, 2 to 3 mm. long, gradually thickened and minutely papillose toward the distal end; anther flattened, basifixed, 1 mm. long, bifurcate at the apex, attenuate toward the base, cells opening at the distal end o- the short thick forks; ovary 4-carpellary, each carpel 2.5 mm. long and abruptly extended into a 2 to 3 mm. long glabrous style which terminates by a small stigma, the subtriangular carpels glabrous but finely rugose; ovules several but usually only one developing into a mature seed.

Type specimen number 13048, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in the humid fertile *Dipterocarp* forested flat at about 250 feet altitude.

Allied to *T. macrophylla Wall.* but ours is less pubescent if not entirely glabrous and inflorescence more loosely flowered.

Wormia sibuyanensis Elm. n. sp.

Shrubs, 3 m. high or higher; stem several or when solitary branched from the base; branches numerously rebranched, quite rigid and brittle; wood moderately hard and heavy, sappy white, odorless, with a slight sweet taste; bark smooth, grayish brown, when old apparently scaling in plates; twigs relatively short, erect or nearly so, glabrous. Leaves copious, suboppositely scattered or crowded toward the distal ends, ascending, rigidly chartaceous, shinging deep green on the upper folded surface, glabrous except the veins beneath, much lighter green beneath, the entire margins subinvolute in the dry state and apiculate toward the sharply acuminate apex, base obtuse, broadly oblanceolate or narrowly obovately oblong, the larger lamina 7.5 cm. long and 2.5 cm. wide above the middle, frequently much smaller and occasionally larger, curing unequally dull brown on the upper and lower surfaces; midrib ridged beneath, sparsely strigose; lateral nerves 5 to 7 pairs, much ascending, also conspicuous and strigose beneath, tips usually connected, tufts of grayish hair in their axils, reticulations rather obscure; petiole 1 cm. long, linear and setaceously pointed, cinereous or subglobose. Inflorescence terminal, erect, solitary or 2 to 3-flowered; peduncle greenish, the erect and subglobose buds reddish brown, subtended by a single narrowly acuminate bract, glabrous, 3 cm. long, somewhat thickened at the distal end; calyx not enlarging and becoming fleshy, glabrous, persistent, rotately spreading; segments about 9, the outer or basal one the smallest, imbricate, gradually becoming larger until the inner whorl of 5 which are 1.5 cm. long and 1 cm. wide and which appear on the ventral middle portion oblong to subrotund, apex rounded, the inner ones reflexed and strongly spoon shaped and with thinner margins; petals 5, caducous lemon yellow, veiny, 2.5 cm. long, 1 cm. wide across its widest portion, obovately oblong, margins entire or very obscurely and irregularly crenate; stamens many, sessile or the filamentous portion dark purple, closely set and appearing as if united toward the base, erect but soon turning outwardly, 7.5 mm. long, 0.75 mm. wide, ligulate, glabrous, truncate or minutely apiculate at apex; ovary bright red, 7.5 mm. long, 4 mm. thick, erect, terete and longitudinally ridged, barrel shaped, a trifle constricted toward the apex, glabrous; stigma arms 8, whitish, ligulate, succulent, glabrous, rotately spreading and recurved, gradually tapering to the apex, compressed, about 8 mm. long, 1.5 mm. wide at the base; fruits dehiscent, of 5 shining wine colored carpels which split from the apex nearly to the base and spread out in a rosette manner, leaving the subglobose brown seeds with their yellow caruncle still attached.

Type specimen number 12087, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Quite commonly scattered along the banks of the Pauala river from 500 to 1000 feet altitude; also noticed along the other river.

Its fruits are very different from *Dillenia* and deserves to be kept in a different genus. There are a few more species of this genus or group in the Philippines.

EBENACEAE

Diospyros alata Elm. n. sp.

A suberect shrub; stem 2 to 3 cm. thick, terete, 3 to 4 m. high, its few main branches arising from below the middle; wood white, moderately hard, odorless and tasteless; bark smooth, ater to murinus, the middle region whitish, the inner side yellowish; branches relatively long, spreading and even raclining for the longer ones, rebranched in subwhorls; twigs slender, terete, blackish when dry, pulverulent or puberulent. Leaves copious, alternatingly scattered along all branchlets, turning nearly black on both sides while drying, entire, glabrous, ascending or horizontal, flat, coriaceous, a shade paler green beneath, rather abruptly acute at apex, its point rounded, base broadly obtuse, the average ones 4 cm. long and 2 cm. wide across the widest part, elliptic or a trifle more oblong; midvein ultimately glabrous, pronounced beneath, minutely grooved above; lateral nerves 5 to 7 on each side, comparatively faint, divaricate, tips archingly united or coarsely reticulate above the middle, the reticulations more evident from the upper side; petiole 3 mm. long, never exceeding 5 mm., also black, puberulous in the young state. Flowers in persistent axillary groups, the short stalks puberulent and very short branched toward the end, bearing few to several flowers; pedicels likewise very short subtended by minute bracts; calyx yellowish green as is also its pedicel, 3 mm. long, glabrous or nearly so, drying black, 4-segmented, well separated even in the bud state, coriaceous, triangular in shape, apex blunt, united only at the very base and persistent, becoming much enlarged in the fruiting state, 1.25 mm. wide across the base; petals 4, cremeus, conically pointed and imbricate in the bud state, 2 to 3 mm. longer than the sepals, united toward the base, the segmented portion similar to the sepals, subglabrous and turning black upon drying; stamens about 8 pairs, inserted upon the basal portion of the corolla base; the glabrous black filaments 1.5 mm. long or the shorter inner one only one half as long and inserted upon the basal portion of the outer filaments; anther grayish, fully 1 mm. long, truncately rounded at the base, basifixed, ovately acuminate, rather slenderly pointed, laterally dehiscent toward the base; ovary deformed, short obovoid, rugose toward the truncately rounded apex, bearing a short point. Fruits upon 5 mm. long stalks, subglobose, at least 1 cm. in diameter, glabrous, green or yellowish tinged, subtended by the 4 persistent and much enlarged calyx wings, all black in the dry state; the segments 1.5 cm. long and lanceolate, the apex blunt, united at the base, thickly coriaceous, minutely striate.

Type specimen number 13128, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In red gravelly soil of shruberries or very light woods near the main light material barracks of the colonists.

Its remarkable calyx wings in the fruiting state distinguish it at once from *D. nitida Merr.*

Diospyros merrillii Elm. n. sp.

Large tree; trunk 12 dm. thick, 20 to 25 m. high, straight, chiefly branched toward the top, more or less wadded especially toward the base; wood hard, odorless and tasteless, the thin outer portion white, rather suddenly changing to the incarnatus inner region, the central mass abruptly changing to a nearly black; bark relatively thin, the outer side numerously checked and scaling in plates, ater or blackish, the middle region testaceus, the inner side yellowish white; main branches spreading but not long, crooked, freely rebranched, forming an elongated or umbrella-like crown; twigs quite bendable, suberect, griseus, the terminal young short portion densely isabellinus hairy, the second year old parts griseus strigose, ultimately glabrous. Leaves coriaceous, alternating, shallowly curved upon the upper deep lucid green and glabrous surface, the nether side of the young leaves thickly brown hairy, these before falling turn griseus in color, diverse in size, the average ones 5 by 12 cm. in size but frequently much smaller, entire, apex rounded and usually terminated by a recurved very sharp point, base obtusely rounded, the sides somewhat curved upon the lower surface, usually obovately oblong. Flowering spikes terminal, short, thick; similarly hairy; angular flowers pistillate, few clustered toward the distal end or alternatingly scattered from the base, very short and thick pedicelled, subtended by caducous bracts; bracts densely hairy on the back, glabrous on the inner side, truncately oblong, 1 cm. long more or less, calyx yellowish green, forming a deep cup; segments 4, ovately rotund, very thick and rigid, 1 cm. long, 7.5 mm. wide, imbricate, smooth and glabrous on the inner side, their exposed bracts densely covered with appressed grayish brown hairs; corolla cremeus, 1.5 cm. long, also the basal one half united and forming a thick tube; the imbricate segments conically contracted, ultimately spreading, oblongish and with rounded points, the left margins rather trongly curved upon the inner glabrous surface, thickly coriaceous, densely canescent on the dorsal surface, either brown or gray; dwarfed or sterile stamens slender, one half as long as the corolla tube, glabrous, inserted upon the base of the corolla; ovary ovoidly globose, densely grayish brown hairy; styles 4, in 2 pairs, 3 mm. long, rigid, angular, coming to a whitish point, subglobose, nearly 2 cm. across, densely isabellinus hairy.

Type specimen number 12895, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This magnificent tree was collected in moist fertile densely forested flat at 250 feet altitude. It is quite commonly scattered throughout the *Dipterocarp* forests of the reservation and is the species commonly cut down by the Iwahig colonists for the black hearthwood in the manufacture of canes and other fine articles made of hard shining black ebony wood. Dedicated to *Mr. E. D. Merrill* who, besides *Mr. Curran*, *Dr. Foxworthy*, and myself, has just recently completed the fourth botanical exploration trip to Palawan.

ERYTHROXYLACEAE

Erythroxylum iwahigense Elm. n. sp.

Burly small tree or only shrub-like; stems few from the same base, 1.5 dm. thick, 7 m. high, its first branches from below the middle; main branches widely spreading over the river bed, ultimately numerously and laxly rebranched; twigs comparatively short, suberect, glabrous, the green portion obscurley, angular; wood hard, heavy, burly, odorous, whitish, suddenly changing to a dark reddish brown or chocolate color; bark deeply checked, scaling in thick but rather small plates, dull brown or gray on the branchlets, otherwise reddish brown. Leaves ascending, along the young tips only, alternate, coriaceous, drying unequally brown on the 2 sides, shallowly conduplicate on the upper very lucid surface, the very blunt and minutely emarginate apex recurved, base obtuse, elliptic, the larger ones 6 cm. long and 2.5 cm. wide across the middle, the smaller obovately elliptic young terminal leaves erect, strongly involute and appearing as an elongated fruiting pod; midvein very prominent and darker brown beneath, flat upon the still lucid side; the lateral nerves very faint, divaricate, about 8 on each side, coarsely reticulate for the outer one half; petiole 5 mm. long, dark brown, caniculate, glabrous. Flowers odorless, erect, solitary from above the old leaves and first from below the new ones or axillary; pedicels nearly 1.5 cm. long, very slender, glabrous, green; bud bracts 3 mm. long, triangularly obtuse, rigid, glabrous, drying brown, caducous, leaving scars; calyx green, glabrous, fleshy, 2.5 mm. long, 1 mm. less in width, ovately triangular, acute toward the callous pointed tip, persistent, erect; petals whitish, 5, erect and forming a false tube, deciduous, 4 mm. long, nearly one half as wide, rounded at apex, thickened and somewhat constricted at the base, glabrous, on the inner side a trifle below the middle provided with a conspicuously rugose membrane or fold; stamineal tube wide, encircling the ovary, 2.25 mm. high, glabrous, irregularly truncate; filaments 2.5 mm. long, crinkled toward the apex, also glabrous, erect, inserted upon the inner side of the rim-like tube a trifle below the edge; anther 0.5 to 0.75 mm. long, oval, shallowly cordate at the base, a trifle wider across the base, cells laterally opening; ovary glabrous, 2.5 mm. long, 1 mm. less in thickness, obovoidly elongated; styles 3, united at or toward the base, outwardly curved toward the distal end, 1.5 mm. long, terminated by a subglobose expanded stigma.

Type specimen number 13227, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in wet stony ground of the wooded Iwahig river bank at 500 feet altitude.

Possibly as near to *E. obtusifolium* (*Wright*) *Hook.* as to any.

FAGACEAE

Castanopsis evansii Elm. n. sp.

Tree; trunk 6 dm. thick, 14 m. high, subterete or the base wadded, chiefly branched toward the top; wood only moderately hard, sourish in odor, tasteless, the outer portion dingy or yellowish white, the greater central mass subolivaceus; bark smoothish, mottled, comparatively thick, dingy or yellowish except the castaneus inner side and the epidermis; main branches widely spreading and ultimately numerously rebranched; crooked twigs suberect, rigid, light gray lenticellede the apical portion somewhat rugose and when very young with subolivaceus scurfy hairs or scales, soon wearing glabrous. Leaves alternate, descending or the young ones ascending, chartaceous, shining, deep green on the upper rather deeply and curvingly folded glabrous side, much lighter. green or brownish gray or grayish white, also glabrate on lower surface, apex gradually or abruptly acuminate and recurved, base obtuse or subrotund, entire margins slightly involute in the dry state, oblong or ovately oblong, curing greenish above and brownish gray beneath, the larger lamina 2 dm. long, 7.5 cm. wide at the middle; midvein dark reddish brown and pronounced beneath, minutely grooved above; lateral nerves 11 to 13 pairs, relatively conspicuous beneath, ascending and parallel, tips much curved, the numerous cross bars equally evident on both sides; petiole 1.5 to 2.5 cm. long, glabrous, thickened at the base, shallowly caniculate. Inflorescence arising from the uppermost leaf axis, 1 to 1.5 dm. long, strict, ascending or yellowish, striate, the young tips olivaceus fine scurfy, few and alternatingly short branched, branchlets ascending; staminate flowers sessile, solitary or in small clusters; perianth composed of 5 or 6 segments; petals 1.5 mm. long, finely pubescent on the exterior, united at the base, ultimately spreading, elliptic or the sixth one oblong; stamens 10, spreading; filaments glabrous, 2 mm. long, subequal in length, arising from below the disk; anther 0.25 mm. long, versatile, oval; ovary disk large, densely puberulent except along the rugose nether marginal region. Fruit upon recurved or subpendant thickened stalks, scattered; the nuts ovately elongated, solitary usually, entirely enclosed by the spinescent carpel; burs 2.5 to 4 cm. long, short ellipsoid or ovoidly so, subsessile or upon a distinct stipe, the exterior surface minutely puberulent and rugosely excrescent, woolly hairy on the exterior basal portion, densely covered with pale or yellowish green needle pointed spines 5 mm. in length and more or less finely puberulent.

Type specimen number 12938, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in red compact soil upon a densely forested incline at 750 feet altitude along the trail leading to Napsan a small trading post on the easth coast of Palawan. Dedicated to *Gov. J. H. Evans* of Puerto Princesa.

Apparently most closely related to *C. castanicarpa* (*Roxb.*) *Spach.* and more distantly to *C. argyrophylla King.*

FLACOURTIACEAE

Hydnocarpus unonifolia Elm. n. sp.

A slender shrub-like tree; stem 1 dm. thick, terete, 5 m. high, rather crooked, branched from near the middle; wood quite soft, odorless and tasteless, the thin sapwood white, otherwise yellow or yellowish; bark relatively thick, smooth, greenish gray blotched on the surface, avellaneus otherwise except the whitish inner side; branches slender, divaricate, freely rebranched, the lax ultimate ones horizontal or drooping, the young twigs finely ferrugineus tomentose. Leaves also drooping or horizontal, thinly coriaceous, flat or only the abruptly acuminate tips recurved, oblong or elliptically elongated, base broadly obtuse or rounded on the larger ones, 7 by 15 cm. but more frequently much smaller, alternatingly scattered along the twigs, when young sparsely hairy on both sides, soon wearing glabrous, entire, curing unequally brown; midrib pronounced beneath, shallowly grooved on the upper surface, puberulent on both sides; the 7 pairs of lateral nerves similar in prominence and in puberulence, their tips much curved and united especially the apical ones, reticulations minute yet very evident; petiole less than 1 cm. in length, stout, short pubescent especially in the younger state; the stout blunt bud bracts densely tomentose. Infrutescence axillary or lateral in small cluster along the uppermost branchlets; stalks 1 to 1.5 cm. long, ligineous, terete, subglabrous, enlarged and slightly hairy at the distal end, bearing one or more mature sessile fruits; mature fruit nearly globose, appearing olivaceus velvety, 1.5 cm. in diameter, hard; seeds 5, flattened and placed transversely.

Type specimen number 12936, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In rather good moist soil of dense forests at 750 feet altitude along the Napsan trail to the west coast of the island.

Scolopia fragrans Elm. n. sp.

A small though strictly slender tree; stem 12 m. high, 2.5 dm. thick, terete but wadded toward the base, its main branches from above the middle; wood hard, heavy, brittle, without odor or taste, the thin sapwood badius, otherwise testaceus; bracts dull brown, smoothish, latericius except the epidermis; branches crooked, freely rebranched and forming a dense elongated crown; twigs lax, grayish or brownish, brown lenticelled, mostly horizontal or drooping, glabrous. Leaves coriaceous, subpendant, the upper shining side deep green and conduplicate, paler and duller beneath, drying equally dull brown, the average blade 1 dm. long and one half as wide at the middle or a trifle below it, the strongly recurved apex sharply acuminate and occasionally subfalcate, base broadly cuneate or obtuse or occasionally rounded, ovately elliptic to oblong, entire, glabrous, alternate, becoming detached while drying; petals black, caniculate, 1 cm. long, glabrous, with a pair of glands upon the upper side at its distal end; midvein quite evident even from the upper side, the color of the dry leaf, with 2 minor pairs from near the middle and extending nearly to the middle of the blade, the basal pair finer and usually with 2 to 3 additional lateral pairs above the middle, reticulations very minute yet very evident from the nether side only. Inflorescence ascending or horizontal, axillary or alternatingly clustered along nearly leafless branchlets; spikes solitary but usually clustered, from a few to 5 cm. long, short pubescent, flower bearing from the base; pedicels 1 cm. long, slender and bracteate, similarly yellowish puberulent, divaricate and usually curved, subtended by minute bracts; flowers cremeus, with a sweet linden odor; perianth shallowly cup shaped, 7.5 mm. broad, subcoriaceous, glabrous or puberulent at the concrete base and along the margins, appearing finely papillose on the outside; segments 2.5 mm. long, about 15, the outer much larger ones alternating with the smaller ones, the former are elliptic, the later are linear oblong, all united into a broad base; stamens very numerous, inserted upon the disk-like base of the perianth; filaments white or when old yellowish, glabrous, filiform and laxly interlaced, unequal in length, the larger 6 mm. long; anthers subdorsifixed, truncate and obscurely bifid at base, ovately elliptic, 1.25 mm. long, the apical one third sterile or warped into a strongly recurved glandular point, dehiscing laterally; ovary 3 mm. long, ellipsoid, glabrous; style fleshy, strict, 5 mm. long, also glabrous, terminated by a slightly enlarged green stigma. Young fruits green, ellipsoid, 1.25 cm. long, with several red seeds.

Type specimen number 12802, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in fertile humus covered ground of the *Dipterocarp* forested flat at 250 feet altitude.

Related to *S. roxburghii Clos.* and to *S. luzonensis Warb.* but apparently nearest to the former.

GESNERIACEAE

Cyrtandra elatostemmoides Elm. n. sp.

Low perennial plants; stems few from the same root, 3 to 5 dm. long, erect or reclining toward the base, 7 mm. thick, angular or fluted, usually unbranched, thickly tomentose with olivaceus hairs. Leaves opposite, very anisophyllous, well scattered, those toward the base somewhat reduced, chiefly horizontal, subcoriaceous, drying unequally brown, the larger blades obovately elliptic, 12 cm. long, 6.5 cm. wide above the middle, entire toward the base, otherwise serrately dentate, the apex broadly rounded, base slightly inequilateral and broadly obtuse, the small blades elliptic to rotund, varying from 1.5 to 3 cm. long, soft olivaceus tomentose beneath, glabrous above and with cystoliths; midrib rather stout, sparsely hairy along the upper side; the nerves 4 to 6 lateral pairs, oblique, their tips reticulately united, the intervening reticulations rather coarse, glabrous on the upper side; petiole very stout, densely covered with olivaceous woolly hairs, those of the small leaves one third as long. Fruits solitary or few clustered, axillary, recurved; pedicels slender and olivaceus pubescent, 2 to 5 cm. long at the base, subtended by minute similarly pubescent bracts; calyx 1 cm. long, deeply cup shaped, olivaceus ciliate on the exterior, submembranous and persistent, ultimately splitting open at one or more places clear to the base, bearing 5 triangular segments which are very slenderly acuminate; fruit sausage shaped, glabrous, 1 to 3 cm. long including the pulverulent neck, 4 mm. thick.

Type specimen number 13207, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In red compact soil on steep forested slopes near a stream depression at 2500 feet altitude.

This remarkable *Cyrtandra* has a striking likeness to certain species of *Elatostemma*.

Cyrtandra inaequifolia Elm. n. sp.

Very lax and soft frutescent plants; stem solitary or few from the same root, hardly ascending toward the ends, rebranched, 1.25 cm. thick more or less; the crooked branchlets horizontally spreading or descending, obscurely angular, the young portion densely light fulvus pubescent, the bark glabrous and stramineus. Foliage similarly disposed, velvety pleasing on the upper very finely pubescent surface, beneath much lighter green or whitish and scarcely pubescent, unequally brown in the dry state, soft membranous, entire or minutely serrate toward the acute to acuminate apex, base usually inequilateral, obtusely rounded in the small ones and subcuneate in the larger lamina, ovately oblong or broadly lanceolate, the larger blades 12 cm. long, almost 4 cm. wide at or a trifle below the middle, opposite, very unequal or anisophyllous, leaving roughened scars after falling, the smaller ones 1.5 by 3 cm. in size; midrib densely fulvus and quite evident beneath, similarly pubescent above; lateral pairs 10 to 12, oblique, subparallel and slightly curved, similar in vestiture, reticulations not evident, the smaller leaves have only one half as many nerves; longer petiole 1.5 cm., densely fulvus, those of the smaller blades one third as long. Flowers odorless, 1 to 3-clustered from the leaf axils, ascending so as to be barely above the foliage, becoming pendant after anthesis; peduncle few mm. long, brown hirsute, bearing 1 to 3 flowers at the distal end; pedicel similar in vestiture and equal in length, subtended by a pair of rather large broadly lanceolate pubescent green bracts; calyx green, cylindric, 1 cm. long, 3.5 mm. thick, membranous; the 5 segments linear lanceolate and extended nearly to the middle of the calyx, very membranous, soft hirsute on the exterior and along the edges of the acuminately pointed teeth, veined, the 2 finer lateral veins united with the middle one and forming a stout midvein toward the apex; corolla flattish, nearly 1.5 cm. long, the basal one half cylindric, inflated at the middle and expanded toward the distal end, also membranous, creamy white, glabrous, slightly puberulent on the exerted outside, the lobes subequal and broadly rounded; the upper lip purple lined or streaked, the lower with a twice of yellow on the throat; stamens 2, inserted a trifle below the middle; filaments carnosus, subglabrous, strongly looped from the middle; anther broadly elliptic, obscurely bilobed at the base; ovary elongated, 3 mm. long, gradually extended into the 4 to 5 mm. long rather thick style, very sparsely strigose or glabrous; stigma subcapitate.

Type specimen number 13092, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Inhabiting rock crevices upon sandy seepage ledges along deeply shaded streamlets at 750 feet altitude.

Cyrtandra rupicola Elm. n. sp.

Ligneous low plants; stems usually few from the same root crown, 3 to 5 dm. long, terete, soft, crooked or ascendingly curved, 3 mm, thick, occasionally branched, light gray, glabrous except the greenish young tips which are fulvus hairy. Leaves opposite, frequently the pairs are much unequal in size, flat, membranous, the old ones glabrous except the veins beneath, curing unequally greenish gray, the nether side much lighter green and appearing finely tessellate, apex obtuse, base cuneate to obtuse, oblong or obovately so, entire toward the base, otherwise obscurely crenate serrate, the blade 4 to 8 cm. long, averaging 2.5 cm. wide across the middle or immediately above it; midrib conspicuous beneath because of its dense fulvus hairs, the 4 to 5 lateral pairs similar in vestiture and curved from the base to tips, reticulations none; petiole 5 mm. long for the smaller blades, 1.5 cm. for the larger, densely fulvus pubescent. Flowers white except the greenish calyx, axillary, descending; pedicel none or very short, subtended by a pair of bracts; the green bracts 1 cm. long and 4 mm. wide, pellucid punctate and glabrous, with a stout midvein, oblong; calyx cylindric, 1.25 cm. long, glabrous or strigose on the exterior above the middle, membranous, obscurely punctate, the faint lateral veins connivent toward the apex with the midvein and forming a much warped apical point, the 5 lobes oblong and with rounded apices, only one fourth the length of the calyx, greenish; corolla white, delicate, 4 to 5 cm. long, the basal one third tubular, very slightly woolly on the outside except at the base, much inflated otherwise; the lobes rotately spreading, broadly rounded, relatively short, unequal; stamens 2, included; filaments nearly 1 cm. long, glabrous, expanded inserted upon the basal portion of the inflated corolla, straight; anther 2 mm. long, sagittately lanceolate, apiculate at apex, attached to the rigid nearly black connective; ovary linear, gradually extended into the style, glabrous, subtended by a callous rim, 3 cm. long with the style which is puberulent toward the distal end; stigma large, rim-like or obscurely lobed, finely papillose. Young fruit 1.5 cm. long, 5 mm. thick, terete, fusiform, appearing scaly, gradually tapering to a fine point, subtended by the subpersistent calyx and all by a separate 6 mm. long greenish bract, the true pedicel only a few mm. in length.

Type specimen number 13213, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Inhabiting rock crevices among loose rocky sandbanks of rivulets in very deeply shaded woods at 2500 feet altitude.

Dichrotrichum biflorum Elm. n sp.

Subscandent and suffrutescent, upon shrubs or small trees; twigs more or less angular and covered by the caesius papyraceous finely pubescent bark, slender, wiry, taking root all along. Leaves alternate, widely scattered, elliptic or subelliptically oblong, the blades 5 by 10 cm., flat, horizontal or descending, coriaceous, a trifle paler green beneath, drying grayish brown, sparsely yet softly pubescent on both sides, base obtuse or truncately rounded, apex blunt and with an obtuse point, margins entire toward the base, otherwise apiculately dentate, the young ones densely tomentose on both sides but especially upon the nether; midrib flat, more densely pubescent than the surface of the lamina, the 5 to 7 oblique nerves equally evident from both sides, with their tips curved, reticulations none; petiole slender, 3 to 5 cm. long, strigosely tomentose; stipule subpersistent, 7 mm. long, about one half as wide, linear, obtuse to acute at apex; soft pubescent on the back and on the apical ventral side. Flower in axillary pairs, the short common stalk strigose, subsessile; calyx about 1.25 cm. long, the 5 segments only united at the base, erect, finely veined and hairy, linear, less than 3 mm. wide, apex abruptly pointed or usually 3-dentate; the 2 lateral teeth unequal in size and smaller than the middle one; corolla 3 to 4 cm. long, gradually expanded from the base toward apex, glabrous except the exterior above the middle and with several hair tufts on the inside toward base, slightly compressed and with oblique throat, membranous; lobes short, unequal, truncately rounded, divaricate in anthesis, entire or the lower ones obscurely fimbriate; stamens 2, inserted at about the middle of the corolla; filaments 2.5 to 3 cm. long, glabrous, slender yet thickened at the curved portion above the middle, adnate to the corolla, much exerted; anthers plump, ovoidly compressed, dorsifixed, 2 mm. long in the early state, united by their mucronate apices, shallowly cordate at base; style filiform and smooth; stigma minute, elongated and glabrous; ovary subtended by a cupular rim.

Type specimen number 13210, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered along a ridge in the lower chaparral region of mount Pulgar at 3750 feet altitude.

GUTTIFEREAE

Calophyllum pulgarensis Elm. n. sp.

A low stocky tree; branchlets numerous, erect, the ultimate ones relatively short and subglaucous. Leaves opposite, many, ascending, obovately elliptic, rigidly chartaceous, entire, flat, apex broadly rounded or occasionally notched, base round or more commonly obtuse, glabrous, deep green on the upper side though brown when dry, beneath glaucous or chalky white, the larger ones 4 cm. long but usually averaging only 3 cm. in length and 2 cm. in width above the middle, frequently only one half as large as the average ones; midrib stout and flattened toward the blackened base, caniculate on the upper surface; lateral nerves contiguous, ascending and only slightly curved, more evident from beneath; petiole glabrous, black, somewhat compressed, thick, only a few mm. long, usully bearing buds in their axils. Inflorescence much exceeding the foliage, terminal, erect, spicate or the larger ones short racemously branched toward the base, solitary, varying from 5 to 10 cm. long, wholly glabrous, flower bearing from below the middle; the stalks dull brown and much wrinkled in the dry state, appearing as if articulately attached; pedicels usually opposite, ascending, similar in color and form, up to 2 cm. in length; buds globose, brown, cremeus in the fresh state, the sepals or outer 4 perianth segments in 2 decussate pairs, elliptic or rotund, rigidly coriaceous, smooth and glabrous, the outer pair 5 mm. across, the inner 2 to 3 mm. wider and longer, concavo-convex; the petals or inner series imbricate, also glabrous, the outer or larger ones nearly 1 cm. long, elliptic or ovately oblong, the smaller inner ones subfalcate and its sides strongly folded upon the ventral surface, about 12 in number or less, the inner ones apparently persistent, finely striate, apex of the larger ones broad or truncately rounded; stamens very numerous, inserted around the basal portion of the ovary; filaments glabrous, crooked, well interlaced, falsely united into branches at the base, 8 mm. long, subequal; anther truncate at both ends and minutely notched at apex and emarginate at base, compressed, oblong, 1 mm. wide at the middle, 1.5 mm. long, dehiscing laterally; ovary large, globose, somewhat rugose when dry, 4 mm. in diameter, glabrous; style 2 mm. long, thick, glabrous, terminated by an equally sized stigma.

Type specimen number 13217, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected upon the rocky summit bearing a dense blanket of chaparral vegetation at 4250 feet altitude.

Very close to number 1478 collected by *C. B. Robinson* in the vicinity of Nha-trang, Annam, Indo-China.

Cratoxylon hypoleuca Elm. n. sp.

A small erect tree; stem 2 dm. thick, 8 m. high, terete, branched from the middle; wood moderately soft or hard, heavy, white, without odor or taste; bark isabellinus on the smooth outer surface, the middle region greenish, scaling in thin minutely checked plates; main branches ascending, giving rise to numerous lax suberect branchlets, the glaucous green young portion glabrous. Leaves usually opposite, membranous or submembranous, glabrous, horizontal or pendant, usually folded upon the upper pleasing green surface and strongly recurved at the gradually acuminate sharp apex, subglaucescent green or hypoleucous beneath, the average ones 1 dm. long by 3 cm. wide below the middle, occasionally larger, frequently smaller, those subtending the inflorescence lanceolate and only 3 cm. long, ovately oblong, occasionally elliptic, base broadly obtuse or rounded, entire, drying brown above, grayish beneath; midrib bold beneath, caniculate above, the lateral nerves very obscure, 7 to 11 on each side, subdivaricate and only slightly curved, reticulations extremely fine and a trifle more evident from the upper side; petiole at most 5 mm. long, deep brown, glabrous, caniculate. Inflorescence terminal or subterminal, spicate or very shortly branched from the base, subtended at the base by small leaves, even the upper branchlets subtended by foliaceous bracts, 1 dm. long more or less, usually curved, the glabrous green rachis subcompressed; branchlets 1 cm. long or less, the basal ones usually longer, bearing a small cluster of flowers at the distal end; pedicel subtended by rim-like bract vestiges, short, distinctly articulate below the middle; flowers early falling, odorless; calyx glabrous and subglaucous on the dorsal side, the outer 3 ater brown or black, the inner ones green; the 5 sepals imbricate, broadly elliptic, united at the base into a short pedicel 6 mm. long by 4 mm. in width, broadly rounded at apex, base similar, concave on the ventral surface, rather thick, the inner ones difficult to distinguish from the outer petals; petals of an equal number, ruber except the greenish claws, thinner in texture, numerously and distinctly veined, more tapering toward the base or claw, about equal in size to the sepals; stamens erect, numerous, grouped in 3 stamineal phalanges 5 mm. long; free filaments glabrous, united portion averaging 1 mm. long, outwardly curved, finely pointed at the distal end; anther cremeus, 0.75 mm. long, versatile, truncate and emarginate or notched at both ends, a trifle wider across the base; ovary elongated, glabrous, 2.5 mm. long, fusiform, 3-lobulate, with one basal ovule in each of the 3 cells; styles 3, as long as the ovary, bearing a slightly enlarged puberulent and green stigma, otherwise glabrous.

Type specimen number 12913, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This rare species was collected in mixed woods along the Iwahig river bank at 250 feet altitude in the cogonal formation rather than in dense forests. The color combination of the flowers with the copious foliage is very pretty!

Garcinia sulphurea Elm. n. sp.

An erect tree; stem 1.5 dm. thick, 7 m. high, terete, straight, branched from below the middle; wood heavy, sappy white, slightly bitter, odorless, rather soft throughout; bark grayish brown mottled, smooth or minutely checked, the middle portion latericius, the whitish inner side bleeding with an abundance of citrinus sticky sap; main branches divaricate, very long, freely rebranched; twigs relatively short, green, ascending, obscurely angled, glabrous. Leaves profuse, horizontal, recurved toward the rather blunt and abruptly acute to acuminate apex, opposite, obtuse at base, glabrous, entire, coriaceous, the blades 7 to 9 cm. long and 3 cm. wide across the middle though frequently smaller, curing brown on both sides, dull beneath, folded upon the upper green surface, oblong or broadly lanceolate; midrib quite prominent; nerves about 9 to 13 pairs, faint though nearly equally plain from both sides, reticulations none. Flowers in small axillary clusters, rigid, sulphureus even in the bud state; pedicel 3 to 5 mm. long, glabrous; calyx also glabrous, composed of 2 slightly unequal decussate pairs of nearly free sepals, 1.75 mm. long, more oblongish than elliptic, rounded at apex; petals free, alternating with the sepals and spreading in a cross-like fashion when in full flower, about 4 mm. long, rigidly coriaceous, also glabrous, subequal, averaging 2 mm. broad, usually somewhat expanded toward the distal end, truncate at base, pulverulent on the back, broadly linear; stamens numerous, about 20, upon a flattened receptacle, erect, sessile; anthers angularly compressed, upon a nearly black base, 0.75 mm. long, apex truncate and usually obscurely emarginate; pistil at first yellowish white but soon turning testaceus, not observed among the dried flowers.

Type specimen number 12907, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in light or secondary forests of fertile soil between open grass patches along the Iwahig river at 250 feet altitude. This same species has twice before been collected on this same island.

Its strongest affinity is with *G. binucao* (*Blco.*) *Choys.*

Garcinia bicolorata Elm. n. sp.

Small tree, with a 2 dm. thick and 7 m. high stem, mainly branched toward the top and forming a flat crown; wood quite soft, yellowish throughout, odorless and without taste; bark roughened with very blunt excrescences, light yellow except the dull brown epidermis, exuding a similarly colored sticky juice; main branches divaricate, repeatedly rebranched; the twigs relatively short but rigid, gnarly at the leaf scars, the glabrous green portion subterete. Leaves suberect, numerous, coriaceous, flat, very copious, much paler green beneath, opposite, in the dry state greenish brown and becoming detached, glabrous, obovately oblong to broadly oblanceolate, the entire margins subinvolute in the dry state, base cuneate, apex obtusely rounded and with a very short blunt point, the normal leaves 8 cm. long, without the petiole 3 cm. wide above the middle; midvein stout, also glabrous; lateral nerves of about 15 pinnate pairs, equally visible from both sides; petiole 1 cm. long, flattened or grooved along the upper side, more or less excavated at the base upon the same side. Inflorescence densely clustered along the branchlets; pedicels green, less than 5 mm. long, relatively thick, glabrous, subterete, spreading; flowers odorless, rigid, caducous, glabrous; calyx very thick and rigid, constricted into a 3 mm. long very thick angular stalk; the 4 segments imbricate, bright cherry red around the apical margin and on the exposed outer side even so in the bud state, broadly elliptic, margins subhyaline, averaging 4 mm. long, curved upon the upper side, broadly rounded; petals as many, alternate, citrinus yellow around the apex and dorsal side, obovately oblong, narrowed toward the base which upon the upper basal portion is padded with a fleshy membrane, 7 5 mm. long, 4.5 mm. wide above the middle, frequently oblique or slightly inequilateral, rounded at apex, reflexed in full anthesis; stamens many, arranged in 4 obscure groups mounted upon a short, thick, angular and glabrous whitish stalk; fleshy filaments very short and glabrous; anther almost 1 mm. wide, one half as high, basifixed, emarginate at apex, the cells subglobose, laterally dehiscent around the upper end and down the sides, atro-purpureus; pistil not seen.

Type specimen number 12950, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Gathered in moist stony soil of a steep wooded slope near a stream depression at about 2000 feet altitude. The bright red color of outer segments and the deep yellow inner ones present a beautiful floral combination!

Garcinia palawanensis Elm. n. sp.

A rather small erect tree; stem 2 dm. thick and 10 m. high, terete, straight, branched toward the top only; wood moderately soft, dingy or yellowish white throughout, odorless and tasteless; bark smooth, grayish white mottled, the greater middle portion yellowish, the inner side white and with latex; main branches rather long, divaricate, freely rebranched above the middle; twigs lax, with ascending tips, roughened by the old leaf scars, the young angular portion glabrous. Leaves thickly coriaceous, chiefly horizontal, copious, spreading, the rather blunt acute or obtuse apex recurved, deeply folded upon the upper much deeper green surface, glabrous, obtuse at base, opposite, drying brown beneath and blackish or steel blue above, the entire margins slightly curved upon the under side, the average blades 1 dm. long, 3 cm. wide at least across the middle, oblong in shape; petiole 5 to 8 mm. long, deeply channeled along the upper side, ridged along the lower; midvein also ridged beneath; the lateral nerves oblique, parallel and straight, relatively minute or obscure, about 20 pairs in the larger ones, reticulations none. Inflorescence terminal or subterminal, upon dark green or greenish black stalks; peduncle less than 1 cm. in length, grooved, glabrous, bearing at the distal end a small cluster of flowers; pedicles shorter, subtended by short rigid obtuse glabrous bracts; calyx green, with brown margins, smooth and leathery, rim-like or very unequally 4-lobulate; petals imbricate, broadly elliptic or ovately so, 4.5 mm. long, thinner than the sepals, very finely nerved, margins subhyaline, the sides strongly curved upon the upper or ventral surface, 4, glabrous, luteus; stamens numerously grouped in 4 phalanges, divaricately spreading, opposite the petals; the phalanges fleshy, broadened, citrinus, glabrous, 3 mm. long; anthers upon very short and compressed filaments, basifixed, averaging 0.5 mm. in width, a trifle shorter, shallowly emarginate at apex, the subglobose cells opening along the edges and over the apical side, promiscuously scattered over the distal one half of the upper side of the phalanges; ovary superior, pulverulent, glabrous, truncately globose, 3 mm. in diameter, terminated by a short blunt point; stigma large, luteus and glutinous.

Type specimen number 13027, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in moist adobe soil of a densely wooded flat at 50 feet altitude.

Very near to yet in my opinion specifically distinct from *G. luzoniensis Merr.* Ours has thicker leaves whose apices are not quite so abruptly acuminate nor its lateral nerves so prominent. Number 678 *Whitford* is in the same condition as to age and sex, though much more floriferous than ours.

HIPPOCRATEACEAE

Salacia cymosa Elm. n. sp.

Climbing and sprawling shrubs; stem 5 cm. thick at least, subterete or wadded, crooked and numerously rebranched; wood without odor or taste, rather soft, with few but very conspicuous concentric rings, the white outer portion gradually blending into the greater latericius central mass; bark smoothish, grayish brown, reddish brown on the young portion at least in the dry state, densely grayish brown lenticelled, tough twigs forming interlaced more or less hanging masses. Leaves opposite, well scattered along the branchlets, chiefly descending, subcoriaceous, deeper green and sublucid upon the upper curvingly folded surface, unequally brown on the dry specimens, entire, obtuse or obtusely rounded at both ends, oblong, the larger blades 15 cm. long and 6.5 cm. wide across the middle, frequently smaller and subelliptic, glabrous at all stages; veins prominent beneath, flat above; petiole 1 cm. long, much thickened when old, caniculate; lateral nerves 5 to 8 on each side, ascendingly curved from the base, quite prominent beneath and very evident from above, reticulations minute yet quite distinct from both sides, the tips of the nerves reticulately united. Inflorescence from the uppermost leaf axils or terminal, the suberect stalks somewhat compressed, subglabrous or puberulent, usually a few peduncles from the same place, cymosely paniculate from near the base, 2 cm. long more or less, all the stalks sprinkled with lenticels and the branchlets subtended by short thick bracts; pedicel 3 to 4 mm. long, glaucous; calyx persistent, rotate, very thick and roughened upon the chalky white or glaucous back; the 5 segments imbricate and ovately rotund, nearly 1.5 mm. long; petals free, 5, imbricate, 3.5 mm. long by 2.25 mm. wide, elliptically oblong, truncately rounded at both ends, coriaceous, the outer ones usually a trifle larger, curved upon the upper side; ovary flattish, constricted at the base, glabrous, slightly 3-ridged toward the apiculate apex; stamens 3, alternating with the ridges and inserted upon the callous rim toward the apex of the ovary; filaments very short, flat, glabrous; anthers 0 25 to 0.33 mm. across, somewhat reflexed over the ovary, oval, basifixed.

Type specimen number 12997, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered among thickets of lightly wooded flats of red soil mixed with small rounded stones at 250 feet altitude.

Salacia subscandens Elm. n. sp.

A tree climbing shrub; stem subterete or wadded, 2.5 cm. thick, quite rigid, numerously branched; wood porous, odorless and tasteless, the outside whitish, the inner latericius, more or less divided into radial sections; bark smooth, grayish, castaneus beneath the epidermis; branches numerous, strongly recurved and forming tangled masses more or less hanging from the support, the young terminal portion few striate and glabrous. Leaves submembranous, usually opposite or occasionally alternate, folded upon the upper green and sublucid surface, very unequal in size; the smaller ones 5 cm. long and subelliptic, the larger blades 15 cm. long by 5 cm. wide across the middle and oblong in shape, drying unequally greenish brown on the two sides, glabrous, apex acuminate, base broadly obtuse, entire or nearly so; midrib brown and raised beneath, also ridgid along the upper side; leteral nerves divaricate, the basal ones with much ascending tips, the tips of the upper ones interarching 5 mm. from the edge, 6 to 9 pairs relatively conspicuous, reticulations faint and coarse; petiole 5 to 8 mm. long, thickened and ascendingly curved, deeply grooved on the upper side, dull brown when dry, glabrous. Flowers in small clusters, odorless, erect, in the leaf axils or from their scar axils, upon brownish black short tubercles; pedicel light badius, glabrous, 3 to 4 mm. long, subtended at the base by a series of strongly imbricating persistent brownish bracts; calyx badius, saucer shaped, 1.5 mm. across, coriaceous, also glabrous, crenately toothed or lobed across the truncate apex; petals 5, free, calyx colored, elliptic or obovately elliptic, imbricate 1.75 mm. long, slightly unequal in width, margins somewhat recurved upon the back, rotately spreading in anthesis; ovary ochraceus, ovoidly globose, 1 mm. long, two thirds of the basal portion grown over by a fleshy glabrous and subglaucous rim, superior; stamens 3; filaments very short and flattened, rather pointed at the apex, arising from the ovary rim toward the apex; anther cells very divaricate, 0.25 mm. long, twice as wide, basifixed, dehiscing along the upper side; style merely apiculate.

Type specimen number 12990, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in moist rather good soil of wooded flats along a dry creek at 250 feet altitude.

Its thinner leaves with more evident nerves and larger fruits distinguish it from *S. integrifolia Merr.*

LAURACEAE

Neolitsea incana Elm. n. sp.

Apparently low rigid shrubs; twigs numerous, short, also rigid, the young portion densely canescent, the old ones glabrous, terete. Leaves alternate or subopposite, numerous, ascending, rigidly chartaceous, flat or the sides toward the base forming a shallow concavity, entire, rather sharply acute, base obtuse to rounded, lucid green above, curing brownish or grayish brown, almost cremeus incarnatus beneath, only the young ones canescent on the upper surface, grayish strigose in old ones or becoming subglabrous, the larger lamina 5 cm. long by one half as wide below the middle; midvein prominent beneath especially at the base, canescent along the upper side in the younger leaves, with a pair of nearly equal lateral nerves 3 mm. above the base of the blade and extending into the apical region, cross bars obsolete; petiole 5 mm. long or longer, thick, distinctly furrowed, incanus, finally glabrate. Inflorescence exceeded by the foliage, 1 to 3 cm. long, erect or ascending, terminal or arising solitarily from the uppermost leaf axils, subtended by rather large deciduous similarly canescent bracts; the peduncle strict, striate, hairy, terminated by a small cluster of flowers; pedicel 1 to 3 mm. long, puberulent, subtended by small caducous bracts; flowers erect; calyx segments rigid, concavo-convex, about 5, imbricate, rotund or orbicular, 3 mm. across, united at the base into a concrete mass, incanus on dorsal side; stamens about 6 fertile and 3 sterile, the larger ones with 4 cells, the small or more dwarfed ones apparently with only 2, upon short hairy stalks, 1 to 2 mm. long, the 3 larger ones provided with conspicuous lateral glands, the most inner series reduced to pubescent conical points, all introrse; ovary 1 mm. long, subglobose, more or less angled through the pressure of the sterile stamens, glabrous, the thick style as long and likewise glabrous.

Type specimen number 13184, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May 1911.

It is another one of the numerous new species collected on a fine May day in the chaparral vegetation on the summit region of mount Pulgar.

Not sure of its rightful genus.

Actinodaphne cinerea Elm. n. sp.

Shrub-like though slender and erect; stems terete, crooked, 1 dm. thick, 7 m. high, branched from above the middle; wood moderately hard or tough, odorless and without taste, light in specific gravity, yellowish and gradually changing to a rather deep yellow center; bark smooth, latericius beneath the grayish brown and more or less mottled epidermis; main branches spreading and finely rebranched, the ultimate ones fulvus tomentulose. Foliage coriaceous, ample, opposite, well scattered, the larger ones 1 dm. long by 4 cm. across the middle, oblong, the smaller ones less than one half as large and broadly lanceolate, apex acute to acuminate, base broadly obtuse or obtusely rounded, glabrous on the upper side, subglaucous and cinereous beneath even so in the dry state, the upper much darker green surface drying greenish brown; petiole 5 mm. long or less, densely fulvus; midrib pronounced beneath, similarly hairy, its upper groove filled with hairs; lateral nerves 7 to 9 pairs, ascendingly curved from the base, conspicuous beneath, their tips faintly united, reticulations evident upon the nether side only. Buds globose, yellowish green, usually few clustered in the leaf axils or in their scar axils, sessile or subsessilely clustered upon short common stalks or tubercle, usually subtended by one or more quite thick similarly hairy bracts, when young forming a globose head, reflexed when old; common perianth segments 4, concavo convex, finely pubescent on the dorsal side and margins, 3 to 5-veined, subequal, elliptic to rotund, 3 to 4 mm. long, occasionally the thin margins become finely lacerate or fimbriate, obscurely punctate; staminate flowers in 3 or 4 groups, subtended by one half dozen of elliptically oblong 1.5 mm. long prominently punctate involucral bracts; stamens about 6 in a cluster, irregularly scattered; filaments unequal in length, the outer ones 1.5 mm. long, the inner ones shorter, hairy toward the densely hairy receptacle; anther 1 mm. long, widest across the truncately rounded apex, basifixed, 0.5 mm. wide or narrower, subcompressed, usually 4-celled, also subtruncate at base; pistillate flowers not observed.

Type specimen number 12947, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in well drained compact humus covered soil of a forested ridge at 2000 feet elevation.

Its finer branches, smaller leaves with characteristic glaucous and cinereous nether sides at ones distinguished it in the woods from the common *Litsea fulva* (*Blm.*) *Vil.* However it was distributed under that genus with my new specific name. Judging from a more careful analysis of its flowers, it belongs to *Actinodaphne* rather than to *Litsae*.

Beilschmiedia nigrifolia Elm. n. sp.

Small erect tree; stem 12 cm. thick, terete, its main branches from the middle; wood quite hard, burly, distinctly bitter, odorless, ochraceus except the darker yellow heartwood; bark grayish brown, more or less checked and scalling in thin plates, latericius except the epidermis; branchlets numerous, lax, crooked, the green apical portion suberect, occasional in subwhorls, grayish white, the glabrous young tips turning deep black while drying, striate or ridged. Leaves ascending, lucid and pleasing green above, glaucous beneath, usually somewhat curved upon the upper side, thinly coriaceous and very smooth, turning black while drying though the glaucous nether side can still be detected, glabrous, greatly varying in size, alternatingly crowded upon the green portion of the twigs, entire, rounded at apex, obtuse or cuneate at base, the larger lamina 1 dm. long by 4 cm. wide above the middle, the smaller ones 5 cm. long and obovate, the others obovately oblong; midrib dark black, shining and glabrous, with 6 to 9 lateral nerves from the upper surface, reticulations very fine and likewise more evident from the upper side; petiole 1 to 1.5 cm. long, black and glabrous, grooved along the upper side, leaving scars after falling. Inflorescence from the lowermost leaf axils or from the axils of scars, ascending, pale green, black when dry, paniculately branched toward the apex, the slender peduncle 2 to 5 cm. long; main branches 1.5 cm. long, rebranched, the strict and divaricate pedicels 3 to 5 mm. long, all glabrous and turning black while drying, subtended by minute bracteoles which soon fall off; buds subglobose, the calyx represented by 3 very small apiculations; corolla alternating with the calyx vestiges, slightly imbricate, concavo-convex, also united at the base, 2 mm. across either way, broadly rounded at apex, 5-veined, puberulent especially along the edge, appearing finely punctate from the sides; stamens about 9; the outer 3 inserted upon and opposite the segments, fulvus hairy, the short filaments compressed and similar in vestiture; the 2 circular anther cells apparently opening upon the ventral side; the alternating 3 pairs quite similar, the outer ones are introrse and without glands while the inner ones are extrorse and with conspicuous baldery glands on the sides toward the base; between these gland bearing stamens are 3 rudiments of puberulent stamens; pistil glabrous, black in the dry state, ovoidly compressed, gradually coming to the short style and minute stigma.

Type specimen number 12834, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered on sand gravelly Iwahig river banks fronting dense woods at about 1000 feet altitude.

Related to but not at all *B. cairocan Vid.*

LEGUMINOSAE

Derris atro-violacea Elm. n. sp.

A scandent tree climbing shrub; stem 7 cm. thick, subterete or twistingly fluted, more or less crooked, looping and hanging; wood soft, porous, the outer portion whitish, nearly roseus in the center, colors gradually blending, odorless and tasteless; bark thick, brown on the stem and gray on the branchlets, covered with yellowish brown transversely set lenticels, latericius except the epidermis, with an abundance of deep molassas colored sap; main branches freely rebranched, slender, the ultimate ones drooping and with ascendingly curved and densely fulvus tomentose tips. Old leaves chartaceous, younger ones coriaceous, subpendant, flat or very shallowly concave on the fulvus tomentose nether side, deeper and slightly shining green above and in the young state grayish pubescent, the very old leaves becoming nearly glabrous beneath, the abruptly acute to acuminate apex recurved, base rounded or subtruncate except the apical leaflet, which is more often obtuse or subcuneate, entire margins slightly involute in the dull brown dry state, alternately scattered toward the ends of short branches, varying from 1 to 3 dm. long, 7 to 9-foliate; leaflets oblong or the slightly smaller and basal ones ovately oblong, the average ones 8 cm. long, 2.5 to 3 cm. wide either above the middle or below the middle or just at the middle; midrib bold beneath, caniculate above; lateral nerves 4 to 5 pairs, much ascendingly curved and nearly as bold beneath, tips obscurely anastomosing, reticulations very conspicuous from beneath only; petiolule 3 to 5 cm. long, terete, slender, similarly pubescent, much enlarged at the base. Panicle profuse, terminal, varying from 3 dm. to 1 m. in length, very limp, curvingly erect, densely ferrugineus except the dark atro-violaceus or vinosus flowers; branches alternating, similarly rebranched, subtended by blunt externally pubescent bracts; the sessile flowers easily falling, their subtending bracteoles subpersistent; calyx turbinate, 3.5 mm. long, fully as wide across the top, densely fulvus pubescent on the exterior; the 5 teeth short, broadly triangular, the upper one branched and obscurely notched at the apex, the 2 lateral ones are the smallest; petals more or less united about the stamineal column toward the base, subequal in length; banner 6 to 7 mm. long, the upper one half broadly ovate, widely cordate at base, rounded at apex, 4.5 mm. wide toward the base, ventrally folded and nearly at right angles from the others, when in full anthesis with a triangular finely spotted central pale yellow blotch; wings 1 to 2 mm. shorter, oblong and rounded at apex, abruptly constricted one third from the base, one of the basal sides broad and ending in a prominent appendage, the opposite side much narrower and merely apiculate; keels united, as long as the banner, broadly oblong for nearly the upper two thirds, deeply sagittate at base, notched at apex, the apical lobes rounded, strongly folded upon the upper side, 4 mm. wide when spread, the claw gradually expanded toward the lamina; stamens as long, 10, only one half of them fertile; filaments glabrous, the upper one third free, those of the sterile tube are very finely purplish spotted; anther versatile, elliptic, less than 0.5 mm. long; ovary compressed, lanceolately linear, densely tawny hairy, glabrous at the constricted base; style also glabrous, 2 mm. long or one half as long as the ovary, very slender and ascendingly curved, bearing a minute stigma.

Type specimen number 13105, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Found sprawling over dense secondary forests of moist reddish soil in a flat at 250 feet altitude.

Allied to *D. ferruginea Benth.*

Derris palawanensis Elm. n. sp.

A lofty tree climber; stem terete or irregularly wadded, 1 dm. thick, bendable, twining about the tree trunks, branched all along from above the middle; wood soft, very porous, dingy white or reddish tinged toward the center, without odor or taste; bark thick, grayish brown, smooth, latericius except the epidermis, freely bleeding with a dark purpureus sap; main branches divaricate, freely rebranched, forming dense hanging masses, the green slender twigs glabrous except the puberulent young tips, in the dry state turning nearly black. Leaves scattering, alternate, horizontally spreading, averaging nearly 2 dm. long, trifoliate; petiole 4 to 6 cm. long, slender, thickened at the base, terete, ultimately glabrous; petiolule less than 5 mm. in length, sparsely pubescent in the young state; leaflets similarly disposed, deeply conduplicate on the upper only slightly deeper green surface, submembranous, the entire margins wavy toward the recurved sharply acute to acuminate apex, base rounded or broadly obtuse for the terminal leaflet, elliptically oblong to oblongish, the larger leaflets 1 dm. long by 4 cm. wide across the middle, curing similarly deep brown on both sides, only the very young ones sparsely strigose on both sides otherwise glabrous; midrib brown, minutely grooved along the upper side; the 5 to 8 lateral nerves much ascending and curved tips of the upper ones faintly united, reticulations obscure; inflorescence divaricate or ascending, from the leaf axils mainly, heavy, profuse, 2 to 5 cm. long, solitary or in few clusters with only few paniculate branchlets subtended by deciduous bracts, the ultimate branchlets very short, all densely fuligineus pubescent; stalks greenish, pedicel with calyx yellowish green, flowers nearly odorless, of rather short duration; pedicels 2 to 3 mm. long, fulvus hairy, subtended by bracteoles; calyx cylindrically turbinate, subtended at or a trifle below it by a hairy bristle-like bract, 4 mm. long and 2.5 mm. thick, similarly fine hairy on the exterior, veiny; teeth 5, very short and blunt, the upper 2 more or less united; petiole also 5, free, up to 7 mm. long, all inserted upon a cartilaginous base of the calyx; banner folded but relatively straight, the basal 2 mm. gradually clawed, the lamina rotund, finely veiny and notched at the apex; wings slenderly clawed below the middle, obliquely oblong, straight at the adnate back edges, obtusely rounded at apex, appendaged at the base on the upper side only, the lamina veiny; keels slightly shorter, slenderly stipitate, linearly oblong, obtusely acute at the apex, folded and bluntly apiculate at the basal upper side; stamineal tube thick, subflavus, glabrous, the slender 1.5 mm. long free filaments ascendingly curved, the upper stamens nearly free; anthers 9, all fertile or nearly so, elliptic, versatile, 0.33 mm. long, the cells widely parted; pistil 6 mm. long; the linear ovary greenish, appressed pubescent, sessile, subterete, 2.5 mm. long; style at least as long, ascendingly curved at apex, glabrous, terminated by a minute dark green stigma.

Type specimen number 13063, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This immense liana-like climber was collected in dense fertile forests along the Napsan trail at about 750 feet altitude. It is quite common and swarms of insects feed upon thet short lived flowers.

It is neither *D. micans* nor *D. mindorensis* of *Dr. Janet Perkins.*

Derris subalternifolia Elm. n. sp.

Tall scandent shrub; stem flexible, 7 cm. thick, wadded, crooked, branched toward the top only; branchlets numerous, tough, subterete, the glabrous or pubescent twig portion comparatively very short and quite rigid; wood porous, dingy yellowish white, odorless and tasteless, the circular central mass surrounded by several peripheral divisions; bark grayish brown on the more or less roughened surface, castaneus otherwise, extending in between the divisions and about the central mass. Leaves mostly descending, coriaceous, folded upon the upper rich and deep shining green surface, much lighter green or even yellowish so beneath, opposite or subalternate, usually 3-foliate, 1 dm. long or longer; petiole including the rachis 3 to 5 cm. long, usually curved, glabrous when old, becoming easily detached; leaflets glabrous, entire, drying unequally brown on its two sides, elliptic, the terminal ones longer, the lateral pairs form above the middle of the stalks, varying from 6 to 10 cm. long and 3 to 5 cm. wide, terminated into a short blunt or more sharply pointed apex, base broadly rounded; petiolule less than 1 cm. long, somewhat thickened, at first puberulent, ultimately glabrate; midrib prominent beneath, impressed above; lateral nerves obscure, 5 to 7 on each side, oblique, tips distinctly united, frequently with secondary intervening ones, reticulations quite evident from beneath. Panicle terminal or from the uppermost leaf axil, occasionally scattered along leafless short branchlets; spikes usually in small groups, 3 to 5 or even 8 cm. long, yellowish green puberulent, divaricately rebranched; pedicels similar in vestiture, averaging 3 mm. in length, slender, subtended by minute caducous bracts; flowers easily falling, possessing sour dough odor, pale sulphur yellow except the grayish ovary and aurantiacus anthers, soft in texture; pedicel strict, 3 to 5 mm. long, finely hirsute; calyx usually subtended by a pair of small puberulent bracts, subglabrous or minutely puberulent, obscurely wrinkled in the dry state, 5 mm. long and nearly as wide, saccate from the base; lobes 5, obtusely triangular except the upper broad one which is terminated by 2 obtusely rounded teeth, reticulately veiny; petals 5, free, averaging 6.5 mm. long, inserted upon the thickened calyx base; the expanded banner broadly elliptic, rounded at apex, abruptly constricted at the base, veiny, ventrally folded and merely at right angles to others; wings oblong, also veiny, the basal one half slenderly clawed, as long as the banner, obtusely rounded at apex, base truncate and with obscure hastate appendages; keels adnate along the lamina, the slender claws free and as long as the others; the stamineal fold 4 mm. long, straight along the lower side, oblique, ascendingly curved, obtusely truncate at apex, with a hyaline lobe at the truncate base, the upper margin hyaline; stamens 9, all fertile, nearly as long as the keels and included by them, forming a large tube, glabrous; the free filamentous portion 0.33 mm. long, the cells divergent at the apex; pistil 7.5 mm. long, the basal one third stipitate and nearly glabrous toward the base, the linear compressed ovary densely hirsute and as long as the stipe, with an ascendingly tipped 2 mm. long glabrous style; stigma minute.

Type specimen number 12965, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Found in the tops of large trees in densely forested fertile flats at 250 feet above sea.

Caesalpinia minutiflora Elm. n. sp.

Scandent and sprawling; stem 5 cm. thick, terete, occasionally branched, quite rigid, naked; wood distinctly bitter, odorless, with a large nearly black pith, soft and porous, the outer one half dingy yellowish white, the balance testaceus; bark yellowish, with a green hypodermis, the middle region also testaceus, the inner side sappy white; branches long, spinescent, the ultimate ones nearly glabrous, reddish brown in the dry state and minutely light brown lenticelled. Leaves alternatingly scattered, ascending or horizontal, 3 to 5 dm. in length, with about 9 pairs of compound leaves; petiole 1 dm. long or less, terete, pulverulent or smooth, rachis similar and usually spiny along the nether side; stipule coriaceous, ovately oblong, 5 mm. long, curved and twisted, minutely pulverulent, striate, usually beneath it with a pair of spines; leaflets coriaceous, flat, yellowish green beneath, shining deep green above, entire, apex truncately rounded and emarginate, base obliquely truncate and inequilateral, 3 cm. long and 1 cm. wide or smaller, the basal pairs smaller, lucid on both sides, curing deep brown beneath and nearly coal black above, sessile, opposite, glabrous, entire; midrib conspicuous beneath; the lateral nerves divaricate and profusely reticulated above the middle. Inflorescence terminal, erect, spicate, terminal or from the uppermost leaf axils, shorter than the leaves; the rachis slender, similarly puberulent, flower bearing from near the base; pedicels also subtended by stipular bracts, ascending, 5 to 8 mm. long, more densely puberulent, leaving large scars after falling; flowers deciduous, slightly fragrant, their buds badius; calyx broadly yet shallowly cup shaped, 5, united at the thickened base, 7 mm. long, puberulent on the outside, roundly pointed, the basal one broader at the base, the upper rather sharply pointed at apex and keel shaped, the lateral ones more elongated, all obscurely veiny and glandular punctate; petals citrinus, 6 to 8 mm. long, subequal, more or less all straight and expanded, conspicuously veiny, the upper one or banner purplish streaked on the ventral side, rotund and emarginate at apex, its base gradually extended into the broad thick claw, the lateral ones or wings obovately oblong and with slenderly tapering claws, the lower ones or keels a trifle shorter and similar to the uppermost one, all brown woolly hairy on the outside of the claw at least; stamens 9, fertile, freely inserted upon a thickened base, 1 cm. long, nearly straight and equal; filaments compressed, widest at the roseus base, crisply hairy except toward the distal greenish end; anther black in the dry state, elliptic, 1 mm. long, bilobed at base and basifixed; pistil about as long as the stamens, the 3 mm. long sessile and subterete ovary soft pubescent, the 6 to 7 mm. long style subglabrous toward the ascendingly curved constricted stigmatic portion. Pods upon 1.25 cm. stalks, compressed, cuneate, sharply pointed at the distal ventral suture, 1 dm. long, 3.5 cm. wide across the truncate apex, gradually narrowed to the broadly rounded base, ridged and leathery brown when dry, glabrous, obscurely veiny from the sides, pendant, with flat rotund seeds 2 cm. long.

Type specimen number 12969, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in jungled woods in wet more or less stony soil at 25 feet. Distributed as a variety of *C. sappan Linn.* but now I think it merits specific rank.

Parkia harbesonii Elm. n. sp.

Middle sized tree; trunk 1 m. thick or less, 15 to 20 m. high, with its main branches toward the top, crooked and only subterete; branches divaricately spreading, crooked and similarly rebranched, forming an umbrella shaped crown; twigs suberect, likewise crooked, gnarly or nodose, glabrous, yellowish gray, densely lenticelled. Leaves alternate, terminally clustered, ascending or horizontally spreading, 2 to 4 dm. long or longer, compound, pinnate from below the middle;

peduncle 5 cm. long, glabrous toward the thickened base, sprinkled with lenticels; rachis olivaceus and densely puberulent, compressed and ridged along the upper side; primary pinnae 15 to 25 opposite pairs, the secondary rachis also puberulent, horizontally spreading; leaflets about 30 pairs, similary spreading, flat, drying very unequally on its sides, 6 to 7 mm. long, 1.5 mm. wide, rounded at apex, base obliquely obtuse or truncate and the lower end sharply pointed, sessile; midvein evident from both sides, reticulations very obscure. Flowering peduncle averaging 1 dm. long, upon a three times as long subterete common stalk which arises either solitary or in small clusters, subterete or angular or only compressed, glabrous, lenticelled; receptacle 4 to 5 cm. long, the distal one third clavately thickened, honey combed or pitted; flowers very numerous, easily falling, cremeus, drying brown, glabrous, 8 mm. long; calyx slenderly tubular, the 6 mm. long tube glabrous and angularly terete, gradually tapering toward the throat, the basal 1 mm. solidly united; the lobes very unequal, elliptic or rotund, the 2 larger ones nearly 1.5 mm. long, rounded at the apex, narrow margins very thin and finely ciliate, not much spreading in anthesis; corolla similarly tubular, exceeding the calyx by 1 m., subhyaline except the midvein, ultimately separating into 5 nearly equal linear segments which are rounded and puberulent at the apex; stamens about 1 cm. long, glabrous, the basal two thirds tubular, the free ends 3 to 4 mm. long, strict or twistingly crooked toward the apex, tips pointed, glabrous; ovary appressed fulvus pubescent, subterete, apex abruptly terminated into the curved and twisted glabrous style, gradually tapering at the base into likewise glabrous 2 dm. long stipes, which are as long as the style; stigma very minute. Fruiting stalk somewhat longer; pods 2.5 to 3.5 dm. long, less than 2 cm. wide, bluntly pointed at the apex, the basal 5 cm. long stipitate, ribbon-like and very characteristically twisted, turning black while curing, bright green and pendant in the fresh state, about 15-seeded.

Type specimen number 13173, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Quite common in scattered forests and especially along river banks at 250 to 500 feet altitude. *P. timoriana* (*DC.*)

Merr. was only observed at Brooks Point (see number 12701), while at middle Palawan this new species predominates. It is a smaller tree whose leaves and flowers are exactly the same as those of the only other Philippine species, yet its fruits amply distinguish it from all other known *Parkia.*

Dedicated to *Capt. James P. Harbeson,* who was in command of the military post at Puerto Princesa during the time of my botanical exploration.

LILIACEAE

Dianella robusta Elm. n. sp.

Perennial tussocks; stems several, erect, 1 to 1.75 m. high, the larger ones 1.25 cm. thick, subterete at the base, otherwise ensiform and clothed with the leaf sheaths; roots profuse, wiry. Leaves linear, also profuse, coriaceous, ascending from the base, striate and much paler beneath, sides curved upon the under side, their edges finely serrate, glabrous, 2 to 3 cm. wide above the middle, 5 to 8 dm. long, glabrous and smooth, gradually tapering to the slenderly pointed and involuted apex, the midvein finely serrate along the middle side, at the base articulated to the persistent rather close fitting sheath, somewhat constricted along the lower one half, much reduced and widely scattering toward the top of the stem, curing equally grayish brown on both sides, strongly recurved, the basal portion ascending and rather dense; peduncle strict, green, much exceeding the foliage, terete, wavy or crooked, branched toward the top; branches ascending, dirty brown scurfy or glabrous, the basal one longest and slender, alternate, subtended by greenish bracts; larger or lowermost bracts 4 cm. long, linear, acuminately pointed, folded upon the ventral side, green though brown in the dry state, those subtending the upper or shorter branchlets very much smaller; the ultimate branchlets bearing paniculate clustered flowers toward their distal ends; pedicels very slender, ascending or recurved, 3 to 8 mm. in length, subtended by lanceolate caducous bracts, only sparsely yellowish brown hairy; flowers odorless, pendant; outer 3 perianth segments 8 mm. long, 3 mm. wide at the base, broadly lance shaped, distinctly

5-veined, all the veins arising separately at the base and conniving at the blunt apex, margins hyaline and purplish spotted, all bluish; the inner 3 segments alternating and a trifle smaller, deeper blue; stamens erect as is also the perianth, glabrous, the outer 3 inserted upon the base of the inner segments; filaments whitish, glabrous, 2.5 mm. long, flattened and expanded toward the base; anther linear, 2 mm. long, shallowly sagittate at the bright yellow base, scarcely wider than 0.5 mm., apex blunt, basifixed; ovary green, globosely ellipsoid, upon a concrete base upon which the inner 3 filaments are attached, 3 mm. in diameter, glabrous and obscurely rugose around the apex.

Type specimen number 12900, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Forming gregarious masses in low black adobe soil of open flats among light woods at about 250 feet above sea.

LORANTHACEAE

Loranthus shawianus Elm. n. sp.

Large dense clumps; stems usually thickened at the nodes, several from the nodose 1.5 dm. thick base, terete, 2.5 cm. thick or less, rebranched, varying up to a meter to three times as long and hanging as streamers; bark gray, coarsely lenticelled along the stem, finely grayish white lenticelled on the branches, the young green tips frequently cinereously puberulent. Leaves leathery, not rigid, yellowish green on both sides, glabrous, curvingly folded upon the upper side, opposite, ascending, variable in size, obtusely rounded at apex, base similarly rounded or subtruncate, entire, elliptic, the blades 6 cm. long by one half as wide across the middle, frequently much smaller, curing dull brown on both sides; midrib quite prominent toward the base on both sides, with 2 to 3 very obscure lateral ascending pairs; petiole 5 to 8 mm. long, subcompressed, leaving large scars after falling. Inflorescent spikes ascending, solitary from the leaf axils or few clustered, from 1 to 3 cm. long, green, subtended by brown bracts more or less angular and somewhat cinereous; pedicels also ascending, more densely cinereous, a few mm. long, subtended by bract vestiges, alternatingly scattered from below the middle; flowers few, scattered, odorless, the buds conspicuously inflated below the middle; calyx tubular, 4 mm. long by 3 mm. thick, the apical rim-like portion becoming irregularly split or remaining truncate, green and cinereous on the exterior except at the rim, subtended by a short acutely pointed bract; corolla 1.5 cm. long, tubular and with a bulge below the middle, pulverulent on the exterior, 6-segmented to below the middle; lobes ligulate, pale carnosus, the upper one half divaricately spreading, edges below the middle fimbriately roughened; stamens as many as corolla segments and opposite them; filaments reddish, fleshy, pulverulent especially along the adnate portion, inserted at about the middle of the lobes, the free portion 2 to 3 mm. long; anthers linear, as long as the filaments; style terete, smooth, terminated by a knob-like greenish stigma, 1.5 cm. long. Fruits purplish red, ellipsoidly elongated, smooth.

Type specimen numbers 12699 and 12610, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

The first number was collected upon a *Canarium* tree while a large *Artocarpus* was the host of the latter number, both of which were standing upon the banks of the Lara river at 30 to 50 feet altitude. The Tagbanuas call it "Bagto." Named after *Dr. Walter R. Shaw*, professor of botany in the Philippine University.

Related to *L. pentandrus Linn.* and to *L. mearnsii Merr.*, but distinguished in a number of minor characters.

MAGNOLIACEAE

Goniostoma pulgarense Elm. n. sp.

Shrubby; twigs numerous, erect, glabrous, grayish white, subterete, roughened by the old leaf scars, the ultimate ones very short. Leaves opposite, rather crowded toward the distal ends, ascending, glabrous, nearly flat, coriaceous, blackish on both sides in the dry state, entire, elliptic or obovately so, acute or obtuse at both ends, 4 cm. long including the petiole, 2.5 to 2 cm. wide at the middle, frequently much smaller; the black midrib also glabrous, not evident on the upper side, the 3 lateral pairs of nerves barely visible even from the lower side; petiole 5 mm. long or less, black in the dry state, glabrous, caniculate. Fruits in small axillary clusters or more frequently from the axils of the fallen leaves, erect, subpersistent; pedicel subglabrous, 5 mm. long, subtended at the base by a series of unequal blunt and glabrous bracts, provided with few alternating bracteoles; fruiting calyx 5-segmented nearly to the base, coriaceous, sparsely puberulent on the back and finely ciliate along the margins, ovately elliptic, 2 mm. long, rotately spreading, apex obtuse; carpels 2, very thick and deeply concavo-convex, dehiscing from apex toward the base, pulverulent on outside, 8 mm. long, elliptic when spread out, terminated by a very short and thick style bearing a large and subglobose stigma; seeds about 16, glomerated into a compressed more or less divided mass, arranged along the central placenta, 2 mm. across, stone-like, very irregular in shape, scaly, short ciliate or pulverulent.

Type specimen number 13197, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected on the summit region of the mountain whose name it bears, scattered among other interlaced shrubs and low stocky trees at 4000 feet altitude.

Talauma pulgarense Elm. n. sp.

A very sparingly branched shrub, 3 to 4 m. high, with a 1 dm. thick stem; branchlets terete, glabrous, the ultimate portion green, the older portion light gray. Leaves alternate or subopposite, usually grouped about the point of branching, very unequal in size, the smaller ones broadly lanceolate or oblanceolate, the larger ones elongated and 2 dm. long by 6 cm. wide a trifle above the middle, cuneate at the base, gradually tapering toward the acute apex, margins entire and usually undulate above the middle, glabrous, similarly grayish on both sides when dry, equally sublucid on both sides, the terminal subwhorl averaging smaller, the nether surface of the old leaves grayish punctate; petiole, 1.5 cm. long, the basal 1 cm. much thickened and with an upper flat surface; midvein prominent and ridged on both sides, similarly gray when dry; lateral nerves 9 to 11 on each side, subdivaricate, straight, their tips united and only slightly arching, at least as evident from the upper side, the reticulations minute and very plain from both sides. Flowers terminal, solitary; stalks 7 cm. long, stout, glabrous, ridged at the base and toward the thickened distal end; bud elliptically elongated, constricted at the base, 2.25 cm. long and nearly 1 cm. thick; perianth segments averaging 2 cm. long and 6 mm. wide, narrowly oblong, in the bud state apparently imbricate and tawny hairy on the inner overlapping surface, in anthesis entirely glabrous and spreading, separately attached upon the torus, broad or truncate at base, obtuse at apex, coriaceous, cremeus, the innermost ones much smaller, about 7 to 9 in number; stamens erect, 1 cm. long, linear, 1.5 mm. wide, upon a short blackish stalk or filament, introrse, flattened, abruptly constricted at the callous blunt point, usually curved; pistil glabrous, 1.25 cm. long and about one half as thick, 5-ridged, terminated in as many rather elongated points.

Type specimen number 13192, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Only one shrub was seen in a forested ridge at 2000 feet altitude of the mountain after which it is named.

Not *T. gitingense Elm.*

MALPIGHIACEAE

Hiptage pinnata Elm. n. sp.

Scandent; stem terete, 3 to 8 cm. long, subtwining, ultimately laxly rebranched; wood pale white, tough, fibrous, without odor, slightly sweet; bark brown, minutely lenticelled, the young portion subglabrous. Leaves light green when young, 3 to 5-pinnate, the old ones similarly dark green on both sides, sublucid on the upper side, chartaceous or submembranous, entire, opposite, well scattered, the abruptly though sharply acuminate apex twistingly recurved, glabrous, base rounded, drying equally brown on both sides, the larger leaflets 15 cm. long excluding the petiole, 6 cm.

wide across the middle, horizontal mostly, ovately oblong; midrib dark brown, smooth, more conspicuous beneath; the lateral nerves 5 to 7 on each side, ascendingly curved, the basal one or two pairs rather faint, tips likewise very faint, reticulations minute or faint yet quite evident from both sides; petiole 1 cm. long or less, rather slender, widely caniculate. Inflorescence upon leafless branchlets, terminal, loosely or irregularly branched, 2 to 5 dm. long or less; spikes solitary or usually few clustered, 5 to 15 cm. long, unbranched, usually curved, canescent; pedicels similar in vestiture, 5 to 8 mm. long, ascending, strict, alternatingly arranged from near the base, persistent, subtended by small triangular bracts, usually 1 or 2-bracteate; calyx 4 mm. long, finely pubescent on the exterior, subturbinate, slightly imbricate and ciliate along the margins, the basal one third united; the lobes elliptic, broadly rounded at the apex, with an elongated callous gland along the upper side at its base; petals 5, free, caducous, sagittately truncate at base, with a 1 to 2 mm. long flattened claw, toward 1 cm. long, the lamina portion rotund or obovately so, margins conspicuously fimbriate or lacerate, the sides well folded upon the ventral surface, strongly imbricate, nearly equal in size and shape, conspicuously veiny, puberulent on the exterior exposed portion; stamens 10, inserted around the ovary; filaments subglabrous, very unequal in length, the lower one 7.5 mm. long and as thick as the style, the inner and upper ones much shorter and thinner, nearly straight except the basal one which curves parallel with the style; anther at least 1 mm. long, ovately elongated, obtuse at apex, basifixed, light yellow, ventrally dehiscing, obscurely sagittate at base; style thick, carnosus, at least 1 cm. long, hairy toward the thickened base, strongly curved, bearing an oblique stigma; ovary rugose, partly imbedded, the exerted portion finely hirsute, conically flattened.

Type specimen number 12589, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Collected along the coast in somewhat swampy soil covered with jungled woods at 25 feet altitude.

MORACEAE

Malaisia blancoi Elm. n. sp.

Scandent upon trees and forming interlaced masses; stem terete, 2.5 cm. thick, freely rebranched; branches divaricate, slender, similarly rebranched, glabrous, reddish brown, densely lenticelled with lighter brown; wood bendable but tough, grayish brown except the central white portion, odorless, nearly tasteless; bark brown, lenticelled on the branches, checked on the stem. Leaves descendingly curved, flat, subchartaceous, darker green on the upper side, glabrous, pale and duller green beneath, alternatingly scattered, the entire margins more or less rugose, diverse in size, the lower or smaller ones elliptic, the larger blades ovately oblong, rounded toward the apex and usually terminated by short blunt point, base broadly rounded, the normal blades 12 cm. long by 5 cm. wide below the middle; midrib dull grayish brown and conspicuous beneath, fluted above; lateral nerves 9 to 13 on each side, rather straight and relatively prominent beneath, tips ascendingly curved and united, cross reticulations more conspicuous toward the outer one half of its sides. Spikes solitary or usually clustered in the uppermost leaf axils; peduncle 1 cm. long or less, slender, densely cinereous, subtended by pubescent bracts; rachis or the flower bearing portion of the spikes 1 to 3 times as long and similar in vestiture; flower sessile, secundly arranged or clustered in a winding fashion; perianth segments 3, ovately elliptic or obovately so, 2 to 3 mm. long, soft in texture, woolly puberulent at least on the dorsal side toward the distal end, united at the base; anthers of the same number; filaments 1 mm. longer than the segments, subglabrous or puberulent toward the subterete base, inserted upon the ventral base of the perianth, looping and ultimately strongly reflexed; anther flattened, 1.25 mm. long, ovately rounded, basifixed, notched at both ends, the cell walls widely spreading after anthesis and turning to a reddish membrane; pistil glabrous, deformed.

Type specimen number 12627, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

In jungled woods along the seacoast. "Slimpagot" is the Tagbanua vernacular name. Dedicated to the celebrated

Manuel E. Blanco, who possessed a great interest in plant life besides performing his regular acclesiastical work.

Taxatrophis obtusa Elm. n. sp

Quite a slender tree; stem 2.5 dm. thick, 10 m. high, branched from above the middle, terete, the main branches ultimately numerously rebranched; the twigs relatively short, suberect, whitish, repeatedly branched, the young more or less angular and its green apical portion glabrous; wood dingy white, concentrically ringed, without taste, brittle and heavy; bark smoothish, grayish white, hypodermis green, otherwise sappy white. Leaves also ascending, rigidly coriaceous or chartaceous, glabrous, shining on the shallowly folded upper surface, the lower side drying dull dirty brown, copious, alternate, exceedingly diverse in size, elliptic or ovately elliptic, the larger ones 5 cm. long by 3 cm. wide across the middle or a trifle below it, the entire margins quite conspicuously curved upon the nether side, base broadly obtuse or more frequently rounded, broadly obtuse at apex and terminated by a minute though sharp usually curved point, the smaller leaves 2 cm. long only; midrib smooth on both sides, bold beneath, finely ridged along the upper deeply grooved side; lateral nerves 5 to 7 pairs, divaricate or ascending, tips united a few mm. below the margins, barely evident from beneath, grayish white, reticulations very minute and of the same color, giving the nether side of the leaves a finely tessellate appearance; petiole 3 mm. long, glabrous, caniculate along the upper side; bud bracts sharply acuminate, similar in color and in length, glabrous. Spikes axillary, erect, the rachis yellowish green, 1 to 1.5 cm. long, 5 mm. thick, terete, at the base subtended by a series of reddish brown glabrous ovate to elliptic rigidly coriaceous bracts, this same series of imbricating bracts scattered along the rachis in a twisting manner clear to the distal end; flowers numerous, sessile, chiefly grouped along the opposite side of the rotund and finely ciliate series of bracts; calyx nearly badius, segmented, membranous, united at the base, oblong, 1.5 mm. long, finely puberulent on the back, margins usually incurved, recurved in anthesis; anthers cremeus, 4, opposite the segments; filaments galbrous, membranous, inserted upon the basal part of the perianth segments, 2 mm. long, outwardly curved; anther 1 mm. long, basifixed, sagittately ovate, very pale yellow; pistil 0.5 mm. long, subcompressed and 4-angled toward the slightly widened apex, bearing 2 minute sessile stigmas.

Type specimen number 12966, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Rather numerous in compact red soil with a gravelly subsoil of a dense secondary forested flat at 250 feet altitude.

Not the same as number 12852 from this same region and which I take to be *T. ilicifolia Vid.*

Parastrophis grandifolia Elm. n. sp.

Medium sized tree; stem 5 dm. thick, 14 m. high, branched from above the middle; wood soft, light, yellowish white, odorless, with a faint sweet taste; bark with latex, conspicuously gray and brown mottled, roughened with excrescences or lenticels, otherwise yellowish white, the young green tips glabrous. Leaves alternate, upon the twigs only, descending, nearly flat, much darker green above, likewise glabrous, drying dull greenish but especially on the under side, broadly oblong or more properly obovately oblong, submembranous, apex abruptly acuminate, base broadly obtuse or rounded, entire, 2.25 dm. long excluding the petiole, 9 cm. wide; midrib pronounced beneath, glabrous, greenish, flat along the upper side; lateral nerves about 13 pairs, pinnate, similar to the midrib in prominence and color, tips strongly curved and interarching, reticulations evident especially on the lower surface; petiole 2 to 3 cm. long, greenish brown, narrowly caniculate; bud short glabrous, the same in color, less than 1 cm. in length. Inflorescent spikes in pairs from the lowermost leaf axils, pendant, 1.5 to 2.5 dm. long, soft in texture, usually curved or twisted, green except the yellowish odorless and sessile flowers; perianth hyaline, glabrous or very minutely ciliate along the margins, obliquely rotund, spreading in anthesis, 1.5 mm. across, the sides frequently rolled upon the ventral side, 4, all united at the very base; filaments also subhyaline, 2 mm. long, crooked or curved, subglabrous, inserted upon the base of the perianth segments; anthers much compressed, basifixed at the truncate base, apex deeply and narrowly notched, 0.5 mm. long or high, 0.75 mm. wide, pale white except the brownish connective; pistils not seen.

Type specimen number 13176, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in moist humus covered soil near a streamlet of a densely forested flat at 500 feet altitude.

Leaves fewer, more than twice as large and not turning brown upon drying as in *P. philippinensis (Buv.) Vil.* The species called *Paratrophis caudata Merr.* may be identical to *Taxatrophis mindanaensis Warb.*

MYRISTICACEAE

Knema latericia Elm. n. sp.

A small though slender erect tree; wood rather soft, reddish tinged toward the center, without odor or taste; bark brown, scaling in thin plates, molasses red beneath the epidermis and with a similarly colored sap; stem at least 1.5 dm. thick, 10 m. high; branches divaricate, chiefly at the top, freely rebranched, the old portion of the twigs gray, the young portion testaceus scurfy. Leaves flat, horizontal or descending, subchartaceous, dark green on the upper glabrous side, glaucous beneath, apex rather short acute or obtuse, base broadly rounded, oblong or the smallest ones broadly lanceolate, the larger blades 14 cm. long by 4 to 4.5 cm. wide toward the base, entire, alternatingly scattered along the twigs; petiole 1.25 cm. long, thick, caniculate along the upper side, densely testaceus scurfy; midrib prominent and in the young state scurfy yellowish brown, also prominent along the upper side, glabrous; lateral nerves 14 to 17 pairs, subdivaricate, parallel, tips much ascending and faintly united, prominent beneath, ultimately glabrous, cross bars very fine and obscure. Flowers solitary or usually clustered upon short thick ligneous tubercles from the axils of the fallen leaves, rigid, sessile; calyx constricted into a very short thick stipe, 5 mm. long beyond the stipe, united below the middle, 3-lobed above the middle, constricted at the middle, densely deep latericius on the exterior; ciliate hairs 0.5 to 1.5 mm. long, short and divaricately spiculate; lobes ovately rotund, smooth and incarnatus on the ventral concave side, nearly 3 mm. long and as wide at the base, the ventral apical portion somewhat extended into a point; ovary very thick, similarly but usually with shorter hairs, 3 mm. across, ovoidly globose, terminated by 8 unequal digitately spreading glabrous stigmas, 1-celled; the solitary ovule erect from the base, not obovoidly elongted, 2.5 cm. long, fuzzy and dark latericius; seed black, covered by a fleshy membrane which at the apex becomes lacerated and apparently turning red upon maturity.

Type specimen number 12757, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in humus covered soil with a gravelly subsoil on the wooded banks of the Iwahig river at 250 feet altitude.

Myristica umbellata Elm. n. sp.

Small or medium sized tree; stem 12 m. high, 3 dm. thick at least, subterete, more or less crooked; main branches from above the middle; wood whitish, tinged with red minute vessels, soft, light, without odor and taste; bark relatively thick, ater gray, smooth or scaling in thin plates, latericius except the epidermis; branches spreading, crooked, numerously rebranched; the ultimate ones slender, lax, green, ascendingly curved, glabrous. Leaves horizontal, the younger ascending, the older descending, flat, coriaceous, deep green and sublucid above, glabrous, green beneath, fumosus when dry especially on the nether side, the obtuse apex recurved, the base likewise obtuse, the smaller ones broadly lanceolate, the longer oblong, the larger blades 4 cm. wide at the middle and 14 cm. long, the entire edges curved upon the under side, alternatingly scattered toward the ends of the twigs; midrib brown and glabrous, ridged beneath and fluted above; lateral nerves 9 to 11 on each side, oblique, tips ascendingly curved, very faint on both sides, reticulations none; petiole stout, 1 to 1.5 cm. long, deeply and widely grooved along the upper side, also glabrous; bud bract brown, glabrous or nearly so, subcompressed, recurved, slenderly pointed, 1 cm. long. Inflorescence ascending from the lowermost leaf axils or from the axils of their scars; peduncle subterete, 5 to 8 mm. long, brown puberulent at first but soon glabrous, stout, straight, bearing an umbel of flowers at the distal end; pedicels 7 to 10 mm. long, slender, spreading, brown in the dry state, glabrous, unequal in length, subcompressed; calyx glabrous, ovoidly elongated, 7.5 mm. long, 4 mm. thick below the middle, subcylindric, 3-segmented toward the truncate apex; the lobes chartaceous except the greenish tips, 1.5 mm. long and as wide across the base, roundly obtuse; stamineal column as long as the corolla, the basal one third glabrous and fleshy, the apical two thirds bearing the linear vertically arranged sessile anthers which extend almost to the very distal point of the connective. Nuts 1 to 3-clustered, in the leaf axils or lateral, their thick and 2 cm. long stalks shining green and pendant, egg shaped, hard, yellowish green, the larger ones 5 cm. long although not fully grown; seed relatively small and with a thick rind.

Type specimen numbers 12820 in flower and 13166 in fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and May respectively, 1911.

Discovered first in dry stony soil of a forested ridge at 1000 feet altitude, later in moist fertile soil of a densely wooded flat at 750 feet elevation.

MYRSINACEAE

Ardisia iwahigensis Elm. n. sp.

A very slender but small erect tree; stem terete, 5 cm. thick, 7 m. high, branched toward the top only; sapwood white, the central mass latericius, moderately hard and heavy, without odor and taste, its radial lines prominent; branches also slender, divaricate, crooked, terete, 7 cm. thick, the lower ones 2 m. long, alternatingly crowded, unbranched, very much thickened at the base, leaving large scars after falling, the tips latericius scaly and ascendingly curved, otherwise griseus; the old bark grayish white, badius inside. Leaves well scattered along the branchlets, alternate, descending, thinly coriaceous, nearly flat or only the acute to acuminate apex recurved, broadly obtuse at base, much paler green beneath, the entire margins subinvolute in the dry state, usually many above the middle, oblong, the broader ones broadly lanceolate, the larger ones 2.5 dm. long by 7 cm. wide across the middle or below it, glabrous, curing grayish above and reddish brown beneath, the young blades densely latericius scurfy beneath, in the old leaves merely punctate; midrib pronounced beneath, shallowly grooved above, sprinkled with latericius scales beneath even in the old ones; lateral nerves 9 to 16 pairs, relatively prominent beneath, divaricate, with ascending coarsely reticulately united tips, other reticulations none; petiole caniculate, 1.25 cm. long, stout, similarly scurfy when young, finally grayish and scaleless. Panicle pyramidal, 1 to 1.5 dm. long, nearly as broad across the base, subtended by a dwarfed leaf; branches alternating, furfuraceous, much angled, divaricate, flower bearing toward the distal ends only; flowers few to several, ascendingly curved, odorless; pedicels at most 2 mm. long, glabrous, fleshy, subtended by linear more or less brown hairy bracts; calyx shining lividus except the whitish base, compressed, of 5 nearly free segments, adnate, ovately lanceolate, 2 mm. long, glabrous except the finely ciliate upper margins, apex acute, base at least 1 mm. wide; petals lilacinus, 4 mm. long, 2.5 mm. wide a trifle below the middle, ovate or ovately oblongish, rather sharply pointed toward apex, very finely purple streaked or spotted but not glandular; stamens of the same number; filaments 0.5 mm. long, compressed, glabrous; anthers dirty yellow, 2.5 mm. long, sagittate and 1 mm. wide at the base, gradually tapering to the rather fine point, compressed, introrse or sublaterally dehiscent; ovary smooth, conical, 1 mm. thick; style reddish, 3 mm. long or longer, straight, only slightly thinner toward the distal end.

Type specimen number 12865, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found in rich soil deeply covered with humus of dense forests at about 500 feet altitude along the trail toward Napsan.

Quite similar to *A. oblongifolia Merr.*

Ardisia ochracea Elm. n. sp.

A large forest tree; bole 1 cm. thick in diameter, 20 m. high or higher, terete, straight, chiefly branched toward the top; wood quite hard and brittle, with conspicuous concentric rings, whitish on the outside, gradually changing to the latericius center, odorless and tasteless; bark smoothish, prominently mottled, latericius except the epidermis; main branches crooked and ultimately numerously rebranched; the twigs lax and brown, glabrous even the young tips. Leaves descending, coriaceous, nearly flat or only shallowly folded upon the upper lucid side, much paler beneath, the acute to acuminate apex strongly recurved, glabrous, usually opposite, curing grayish brown; base broadly obtuse or rounded, elliptic or ovately oblong, the average leaves 12 cm. long by 5 cm. wide at or a trifle below the middle, the entire margins recurved at least in the dry state; midvein conspicuous beneath, with 5 to 7 relatively faint lateral divaricate nerves whose tips are branched and coarsely reticulated, the nerves nearly as evident from the upper side as from the lower, reticulations obscure; petiole black when dry, likewise glabrous, caniculate, 1 cm. long. Inflorescence chiefly terminal or from the uppermost leaf axils; peduncle 5 to 15 cm. long, somewhat recurved or drooping, glabrous, green, racemosely branched from below the middle; branchlets similarly rebranched, subtended by small bracts; pedicels 1 to 5 mm. long, subtended by equally sized glabrous bracts; flowers profuse, ochraceus, without odor; calyx of the same peculiar green as the inflorescent stalks, glabrous, stipitate at base, the 5 segments united below the middle, imbricate, averaging 2 mm. apart, subtruncate at base and minutely fimbriate; petals ochraceus even in the imbricately twisted bud state, 4 mm. long by 3 mm. wide across the middle, elliptic, free though imbricate, eglandular, entire, margins considerably thinner; stamens sulphureus, also fine; filaments 1.5 mm. long, usually crooked at the base, conspicuously rugose, gradually enlarging toward the distal end; anther terminal, notched at the apex, the 2 cells widely dehiscing laterally; ovary rim rugosely folded, aurantiacus, in each of the 5 inner folds provided with a subconical gland terminated by a seta-like apex; ovary short, subglobose, also glabrous, bearing a large hood-like sessile flavus stigma.

Type specimen number 12881, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in rich humid forests at 750 feet altitude along the Napsan trail leading to the west coast of Palawan. Its profuse buds and flowers deck the tree crowns with a mantle of yellow!

Apparently not true *Ardisia* and may represent a new genus.

Ardisia romanii Elm. n. sp.

Erect but rather crooked trees; stem terete, 1.5 dm. thick, 7 m. high, branched chiefly at the top; wood moderately soft, odorless and without taste, with conspicuous radial lines, testaceus throughout; bark of the same color except the brown and gray mottled smooth or minutely checked surface; branches forming a rather small dense crown, divaricate, unbranched, ascendingly curved toward their ends, the larger or main branches occasionally rebranched, the young green portion glabrous. Leaves light green when young and ascending, the old ones pendant, rigidly coriaceous, usually somewhat folded on the upper side or nearly flat, much paler green or subglauceous beneath, alternate along the branchlets, elliptic or ovately oblong, apex rounded or broadly obtuse, base obtuse or subcuneate, drying greenish or nearly brown, entire, the average blades 15 cm. long by almost one half as wide across the middle or above it, the lower ones generally much reduced, glabrous; midrib very thick beneath, flat and grooved on the upper side especially toward the base; lateral nerves about 20 pairs with frequently intervening ones arising from the midrib and extending only one half the distance, oblique, relatively minute yet equally seen on both sides, reticulately anastomosing at their ends, the intervening reticulations evident from both surfaces; petiole very stout, broadly furrowed, 1.5 cm. long, glabrous. Inflorescence glabrous, rigid, arising from the uppermost leaf axils; stalks greenish, recurved, 1 to 2.5 cm. long, compressed, alternate, bearing an umbel of flowers toward the distal ends; flowers odorless and caducous; pedicel 7.5 mm. long, nearly one half as thick, glabrous, also curved, subtended by rim-like bract vestiges; calyx shallowly cup shaped, also glabrous, with 5 short but relatively broadly rounded lobes, subauriculate at the base, imbricate, the 6 mm. broad basal portion very thick and hard, the middle region densely gland dotted, the thin margins egandular; petals 5, deep lividus, even the calyx of the same color, free or slightly united at the base, 1.25 cm. long, nearly one half as wide, oblongish, abruptly constricted toward the broad base, apex obtusely rounded, leathery, also glandular in the middle, the thinner margins usually rolled upon the upper surface, twistingly imbricate in the ovoid bud; filaments 5, thick and fleshy, pink, flattened, 3 mm. long, nearly as wide at the base, yellowish on the inner, caesius on the outer side; anthers 6 mm. long, 2.5 mm. wide across the subtruncate base, gradually tapering to the acute apex, introrse, dorsifixed; ovary pale yellow, subglobose, 3 mm. in diameter; style whitish, about 1 cm. long, glabrous, conspicuously looped at the middle, gradually and finely pointed toward the apex.

Type specimen number 12902, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered this fine species in thin woodlands at 250 feet altitude in rather hard, dry and gravelly or even stony ground. Named in honor of *Father Victor Román*, then chaplain of the Iwahig Penal Colony, and whose guest I was priviledged to be while making my botanical collection on the reservation.

Discocalyx merrillii Elm. n. sp.

Shrub; stem 15 cm. thick, 5 m. high, branched from below the middle; main branches suberect or the widely spreading branchlets reclining and recurved; wood quite hard, heavy, odorless and tasteless, latericius throughout and radial lines prominent; bark smoothish or roughly lenticelled, castaneus except the grayish brown epidermis; twigs not numerous, erect or suberect, terete, 7 to 8 mm. thick, the young apical portion ridged and glabrous. Leaves alternatingly crowded, ascending and strongly recurved toward the slender and sharply acuminate apex, attenuate toward the base, narrowly oblong or the smaller ones oblanceolate, glabrous, entire, coriaceous, paler green beneath, drying equally grayish on both sides, the average ones 2.5 dm. long by 5 cm. wide across the middle or a trifle above it; midrib very pronounced beneath, grooved along the upper side; the 9 to 14 lateral nerves rather straight, oblique; thin tips reticulately united, relatively obscure; reticulations likewise obscure, minute, a trifle more evident from the upper surface; petiole thick, 1 to 2 cm. long, flat on the upper side, gray when dry. Inflorescence odorless, upon 1.5 to 3 cm. long ligneous divaricate terete branches, lateral, below the foliage or occasional from the lowermost leaf axil; rachis stramineus, 3 to 6 cm. long, stellately spreading, several, compressed and subglabrous, curing brown, leaving dense transverse scars after falling, flower bearing from near the base; bud bracts brown, glabrous, imbricate, 1 cm. long, sharply acuminate; flower solitary or more frequently in small groups, irregularly scattered; calyx ashy gray when dry, glabrous, subsessile and somewhat constricted at the very base, cup shaped, 2 mm. long and nearly as thick, truncate or obscurely 5-lobulate or merely undulate, occasionally gland dotted on the inner side; corolla 3 mm. long, the basal one half forming a broad tube, glabrous; lobes 5, more or less glandular, 1 to 1.5 mm. long, truncately rounded at apex or emarginate, oblongish, the sides rolled upon the upper surface in the dry state; stamens inserted upon the corolla tube, sessile; anthers flattened, at least 0.5 mm. long and as broad at the base which is a trifle wider than at the notched apex, truncately sagittate at base, the blackish brown connective densely glandular, the cells opening laterally; ovary relatively large, glabrous, ovoidly conical; stigma sessile, 1.25 mm. across, disk-like, the nether edges distinctly lobulate or star-shaped. Young fruit solitary or sessile or upon very short more or less elongated stalks and clustered, red or whitish and sprinkled with red, globose, shining, subtended by the spreading calyx rim; stigma flattish globose and sessile.

Type specimen number 12825, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in fine gravelly soil along the wooded Iwahig river banks at 500 feet altitude as well as along smaller streamlets. Named with pleasure after *E. D. Merrill*, government botanist for the Bureau of Science.

OCHNACEAE

Ochna foxworthyi Elm. n. sp.

Slender tree; stem 2 dm. thick, 12 m. high, terete or subterete toward the base, nearly traight, branched only toward the top; sapwood dingy white, gradually changing into the latericius greater central mass, odorless and without taste, moderately hard; bark dull ardisiacus, conspicuously scaling in small thin plates, relatively thin, isabellinus beneath the epidermis; main branches short, numerously rebranched, forming a condensed crown; twigs lax, very flexible, the young tips glabrous. Leaves ascending or horizontal, recurved toward the obtuse apex, usually slightly conduplicate upon the very shining upper surface, duller beneath, even so in the brown dry state, coriaceous, alternate, entire or the sides very minutely serrate, base subcuneate or obtuse, narrowly oblong, the average blades 8 cm. long by 2.5 cm. wide across the middle; midrib rather conspicuous especially beneath; lateral nerves numerous, very fine, quite oblique and only slightly curved from the base, doubly united 1 to 2 mm. distant from the edge; petiole 5 mm. long. Inflorescence terminal, suberect, upon short scar marked terete spikes 1 to 2 cm. in length; flowers deciduous, crowded and arranged on all sides of the receptacle; pedicels light creamy white, very slender, glabrous, drying brown, 1 cm. long, strongly and sweetly scented; bracts appearing axillary, fuligineus, caducous, leaving the conspicuous scars after falling, glabrous, conically imbricated; calyx cremeus, glabrous, imbricate, subpersistent and widely spreading; sepals 5, subequal, 5 mm. long, one half as wide, truncate at base, rounded at apex, subcoriaceous, veiny; petals very similar though lighter cremeus and thinner in texture than the sepals, also equal in number; filaments strict, subterete, 1.5 mm. long, ascending, persistent, 10; anthers ochraceus, linear, 1 mm. longer, 0.75 mm. wide, basifixed, obtusely rounded at both ends with a large connective, laterally dehiscent; ovary also glabrous, composed of 5 separate subglobose carpels, the 0.75 mm. thick carpel connected with the style from near the base; style 1 mm. long, also glabrous, erect, bearing at the apex a rugolose flattened stigma.

Type specimen number 13074, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in low mixed secondary forests of flats at 50 feet above sea level. Named after *Dr. Foxworthy*, who collected a very similar species in the same general region (see Bureau of Science number 903). The strongly fragrant flowers are visited by swarms of insects.

OPILIACEAE

Opilia fragrans Elm. n. sp.

Scadent and shrubby; stem looping, crooked, terete, flexible, 2.5 cm. thick and numerously rebranched toward the top; wood porous, bitterish, odorless, yellowish; bark similar in color, smooth or minutely checked; branches slender, green, smooth, terete, the ultimate ones drooping and forming dense interlaced masses. Leaves copious, alternate, coriaceous, chiefly horizontal, the acute apex recurved, deep lucid on the upper surface, paler green and duller beneath, equally brown on both sides in the dry state, obtuse at apex, entire, oblong, glabrous, the average leaves 3 cm. wide at the middle and 10 cm. long; midrib conspicuous from both sides; the 5 to 9 lateral pairs rather obscure, ascendingly curved, reticulations obsolete, the basal pair running parallel with the leaf margin; petiole 5 to 8 mm. long, glabrous, grooved along the upper side. Spikes few clustered from the lower leaf axils, pendantly recurved, yellow with a greenish tinge, strongly and sweetly fragrant, as soft as the flowering catkins of the willows, 1 to 3 cm. long; the dry reddish brown rachis flower bearing from near the base, minutely pubescent, subtended at the base by a series of small yellowish gray bracts; pedicels similar, solitary or in small clusters, 1 to 3 mm. long or longer, puberulent; calyx subglabrous, coriaceous, minute and merely disk-like; petals in the obovately globose bud valvate, 5, spreading and strongly reflexed in anthesis, equal, free, 1.75

mm. long, 1 mm. less in width, glabrous, subcoriaceous or submembranous, base truncate, apex obtuse, caducous, oblong; stamens opposite them, 5; filaments 1.5 mm. long, glabrous, filiform; the thick dark reddish brown 5 appendages erect and nearly free, glabrous, the 0.75 mm. long truncately pointed segments alternating with the fertile stamens and inserted between the petals; anthers compressed, 0.5 mm. long, ovately elliptic, light yellow, obscurely indented at the base, subversatile; ovary less than 1 mm. in length, fusiform, glabrous Fruit ellipsoid, 2.5 cm. long, yellowish green, 1-celled and 1-seeded.

Type specimen number 12691, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Climbing upon small trees along a wooded rivulet of wet sand gravelly soil near the beach. Called "Aratig" by the Tagbanuas.

Judging from description it differs in a number of details from both *O. javanica Miq.* and *O. amantacea Roxb.*

PITTOSPORACEAE

Pittosporum pulgarense Elm. n. sp.

Low shrub, with rigid branches; twigs terete, dull brown and usually with minute light gray lenticels, the young portion fulvus hairy, usually branched in subwhorls. Leaves terminally crowded, copious, mainly at the point of branching, ascending or horizontal, very unequal in size, thickly coriaceous, curing blackish, glabrous on the upper minutely rugose surface, the nether smooth surface pale fulvus, lanose in the young state but soon wearing glabrous, margin entire and somewhat curved upon the under side, flat or only the sharply acute to acuminate point recurved, base cuneate or obtuse, obovately elongated or broadly oblanceolate, the larger ones 8 cm. long by 2.5 cm. wide above the middle, frequently much smaller, alternate or subopposite; midvein glabrous on both sides in the old leaves, prominent beneath and impressed above; the lateral 6 pairs ascendingly curved, their tips obscurely united, not very evident even from below, reticulations obsolete; petiole 5 mm. long, at first densely fulvus, stout, leaving scars after falling. Racemose panicle erect, terminal, 3 cm. long and about as wide, branched from below the middle, exceeded by the subtending leaves; branchlets striate, the lower ones angular and again rebranched, sparsely rufous hairy, the strict pedicels at least 5 mm. long and subtended by caducous bracteoles; calyx of 5 distinct sepals, thick, ovately acute, bristly hairy on the back, 2.5 mm. long by 1 mm. less in width; sepals also 5, alternating with the sepals, caducous, elongated, glabrous, 6 mm. long, less than one third as wide, reflexed in anthesis, obtuse at apex, 3-veined but the middle one stouter; stamens also 5, erect, easily detached; filaments nearly 3 mm. long, subcompressed, smooth; anther broadly sagittate, flattened, basifixed, less than 1 mm. long; ovary ellipsoid, densely fulvus hairy, relatively long, with a very short and thick style; stigma obscurely 3 to 5-lobed; cells 1 or 2, the ovules attached laterally along the central placenta when 2 celled.

Type specimen number 13188, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered upon the rocky summit of of the mountain after which it is named, forming with numerous other shrubby species a dense blanket of chaparral.

As far as our Philippine material is concerned it is most closely related to *P. odoratum Merr.*

PROTEACEAE

Helicia artocarpoides Elm. n. sp.

A slender suberect tree-like shrub; stem 7 cm. thick, 5 m. high, more or less crooked, unbranched, terete; wood moderately soft, dingy white, odorless and without taste, with conspicuous radial lines; bark dull dirty brown, smooth or minutely checked, isabellinus except the epidermis. Leaves alternate, crowded at the top; petiole green, leaving large scars after falling, terete, rigid, very thick at the base, 1 to 2 dm. long, strict, the swollen basal portion curved, with a testaceus bloom; blades chartaceous, chiefly horizontally spreading, averaging 9 dm. in length, oddly pinnate, flat or sligthly recurved toward the distal end, with largest segments in the middle region, the apical segment somewhat broader and less pointed; larger segments 3 dm. long, 8 cm. wide across the middle, well tapering to the acute or acuminate point or even obtuse, the distal one half usually slightly recurved or descending, opposite, the slightly narrower sinus well rounded at the base, narrowly oblong, 1.5 to 3 cm. decurrent along the stout midrib, the entire marginal portion twisted and prominently rugose, glabrous, sublucid on both sides, drying blackish brown, a trifle paler green beneath; midrib extremely stout and rigid, turning blackish while curing, the primary lateral ones similar; the secondary lateral nerves 10 to 15 on a side, forming a united line 3 to 5 mm. below the edge, all ascending and rather straight, reticulations numerous and relatively prominent from both sides. Inflorescent spike solitary or in small bundles, divaricate, widely scattering along the stem, averaging 15 cm. long, testaceus pulverulent or puberulent; the slightly fragrant flowers scattered on all sides, deciduous, coming into anthesis from base toward apex; peduncle 2 to 3 mm. long, puberulent, relatively thick; pedicel similar, usually 2, somewhat thickened at the finely ciliate distal end; perianth as well as the buds and rachis including the short stalks all flavus, 1 cm. long, ligulate, 1 mm. wide, a trifle wider toward the obtusely rounded apex, very sparsely short hairy on the outside or also glabrous, strongly recurved, early falling; stamens 3, borne upon the segments 3 mm. below the apex, sessile; filaments very short or none, extended beyond the anthers cells into a subcompressed roundish point, black when dry; anther linear, 1.5 mm. long, 0.5 mm. wide, pale yellow, introrse, dorsifixed; pistil as long as the perianth segments, nearly straight, enveloped by a membrane of the central or four perianth segments, the glabrous ovary ovoidly elongated, style slender and whitish, the 2 thickened and greenish stigma lobes short woolly gray on the stigmatic surface.

Type specimen number 12946, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan. April, 1911.

This *Artocarpus* leafed *Helicia* was discovered on well drained forested ridges of compact soil at 2000 feet altitude. Only one plant was found!

RHAMNACEAE

Zizyphus palawanensis Elm. n. sp.

A scandent and sprawling shrub; stem terete, flexible, 2 to 3 cm. thick, repeatedly branched toward the top; wood soft, porous and with sweet clear watery juice, yellowish white except the brownish central mass; bark smooth or lenticelled, the middle portion isabellinus; main branches widely spreading, green, tough, bearing raised deeply indented elongated lenticels; twigs numerous, divaricate, also green, relatively short, spinescent, only the young tips olivaceus puberulent. Leaves horizontal or descending, shining green upon the upper shallowly curved surface, paler beneath, drying unequally deep brown on the two sides, the gradually acuminate apex strongly recurved, the base generally a trifle inequilateral and broadly rounded or shallowly cordate, entire or crenately dentate on the sides toward apex, the lower or larger blades 9 cm. long by 4.5 cm. wide at or below the middle, the upper ones scarcely more than one half as large; petiole less than 1 cm. long, sparsely olivaceus strigose when young, glabrous when old, ascendingly curved at the base, subtended by a recurved spine; veins 3, arising from the base, converging into the apex, bold beneath, impressed above, the 2 lateral ones with 5 to 7 outer much ascendingly curved secondary ones, the cross bars more evident from below. Inflorescence from the uppermost leaf axils, erect, slightly fragrant, varying from 1 to 7 cm. long, alternatingly branched, all the stalks in the young state yellowish brown or gray puberulent; branches rigid, divaricate, 1 cm. long more or less, rebranched toward the distal end; pedicels short velutinous, 1 to 2 mm. long, subtended by a series of a minutely ciliate bracteoles; calyx greenish, campanulate, also velutinous, 2.5 mm. long or less, leathery, the 5 triangular segments only one half as long and valvate; petals yellowish green, shorter than the calyx teeth, alternating with them, inserted upon the calyx rim, short yet distinctly stipitate, the thin lamina portion hood-like or folded and forming a ventrally opening pocket; stamens of the some number and directly opposite the petals and inserted upon the same rim;

filaments 1.25 mm. long, slightly expanded and compressed toward the base, glabrous; anther greenish white, oval, 0.33 to 0.5 mm. long, compressed; pistil short, gradually tapering from the puberulent basal portion to the 2-lobulate stigma; ovary disk yellow.

Type specimen number 12891, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Gathered from the tops of forest trees in a fertile flat along the trail to Napsan at about 750 feet elevation.

Flowers at least distinct from 453 *Cuming* or the type sheet of *Z. cumingiana Merr.*

Ventilago palawanensis Elm. n. sp.

A lofty tree climber; stem terete, 5 cm. thick, bendable, branched toward the top; wood porous, soft, yellowish especially the central mass, odorless, a trifle sweet to taste; bark relatively thick, whitish except the dull brown or gray smooth or shallowly checked surface; twigs greenish, lax, profuse, wiry, the young tips finely cinereous. Leaves alternate, occasionally subopposite, descending, nearly flat, diverse in size, subchartaceous, the nether side when young subcinereous, ultimately glabrous, greenish brown in the dry state, entire, the apex obtusely rounded and obscurely emarginate at the point, base similarly pointed or very short subpandurate, lucid above even when dry, the larger ones 4.5 cm. wide across the middle, 12 cm. long, oblong, frequently much smaller; old petioles glabrous, less than 5 mm. long, relatively thick and widely grooved along the upper side; midrib quite conspicuous on both side, likewise glabrous in the mature leaves; the 5 to 7 lateral nerves ascendingly curved, equally visible from both sides, tips running parallel with the leaf margins, reticulations minute and relatively very evident from both sides. Panicles few, 2 or more dm. long, terminal, slenderly though sparingly branched, subtended by small leaves or mere foliaceous bracts; the branchlets fulvus or cinereous, the smaller or ultimate ones unbranched, very flexible; flowers with a faint agreeable odor, in dense glomerules, alternatingly scattered all along; pedicels very short, cinereous, subtended by bract vestiges; calyx shallowly cup shaped, valvate in the flattened or pantagonal bud state, finely pubescent on the outside, the basal two thirds united, the 5 teeth triangular, coriaceous especially the basal part; petals deciduous, membranous, 5, alternating with the sepals and inserted upon the calyx rim, 1 mm. long, clawed or cuneate at base, the ovate expanded portion folded upon the ventral side and widely emarginate, glabrous; stamens as many and inserted upon the basal portion of the petals; filaments 0.75 cm. long, glabrous, outwardly curved; anther apparently within corolla fold, 0.33 mm. long, subversatile, broader than long; ovary with the 2 divergently curved stigmas 1 mm. long and short woolly hairy around the base only.

Type specimen number 13224, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This looping climber was discovered on large forest trees on gravelly banks of a dry stream at about 500 feet altitude. Its ultimate branches forming dense hanging masses over the open creek bed.

RHIZOPHORACEAE

Sagittipetalum palawanense Elm. n. sp.

Slender and suberect tree; stem 1 dm. thick, 7 m. high, subteretere, chiefly branched toward the top; wood moderately hard, dingy white, odorless and without taste, with conspicuous radial lines; bark dull brown, smoothish or only minutely checked, latericius except the epidermis; branches numerously rebranched, crooked and forming interlaced masses; the nodose twigs suberect, green, glabrous, subcompressed, flexible and slender. Leaves opposite, glabrous, drying unequally deep brown on the two sides, ascending or horizontal, flat, each twig with one or two pairs, the lower pairs smaller, the entire or very minutely serrate margins curved upon the wider side at least in the dry state, usually obovately rotund or frequently broadly elliptic, terminated by a very short and blunt point, base very broadly cuneate, the larger lamina 7 by 11 cm., coriaceous, the smaller ones less than one half as large; midrib conspicuous on both sides, deep reddish brown; lateral nerves relatively faint, 6 to 8 pairs, ascending, strict, tips archingly united 5 mm. below the edge of the leaf and again minutely united near the margins, reticulations more evident on the upper surface; petiole 5 to 8 mm. long, glabrous, dark, reddish brown, gradually extended into the lamina; bud bract similarly colored, compressed, 1 cm. long; buds ovately conical; calyx a trifle less than 1 cm. long, deeply campanulate in full flower, coriaceous, glabrous, about 6 mm. thick, 6-segmented; the lobes are triangularly acute to acuminate, slightly reflexed in anthesis, about one half the length of the calyx; petals 6 mm. long, also glabrous, membranous, alternating and inserted upon the throat of the calyx, segments upon a flattened 2.5 mm. long claw; the expanded portion triangular in outline, the sagittate lobes very long and usually the terminal portion refolded upon the ventral side, all the margins very irregularly fimbriate, folded upon the upper side; stamens 10, alternatingly inserted upon the base of the sepals and petals; filaments 3 to 4 mm. long, erect, glabrous, gradually tapering from the much compressed base toward apex; anther ovoid, rather sharply pointed, 1 mm. long, auriculate at the base, basifixed, opening along the dorsal edge; ovary 1-celled, apparently imbedded, cup shaped at the apex and with about 10 round and fleshy divisions; style also glabrous, very thick, 3 mm. long, terete, terminated by a flattened circular stigma; ovules several, subpendant from a central placenta.

Type specimen number 12828, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in gravelly soil of the wooded Iwahig river banks at 750 feet altitude.

Very close to but not identical with *S. mindanaensis Merr.*

RUTACEAE

Evodia pulgarensis Elm. n. sp.

Shrubby; twig glabrous, greenish, angularly compressed, rebranched from the leaf axils. Leaves opposite, ascending, 1.5 dm. long or the uppermost ones much smaller, 3-foliate;

petiole 5 cm. long, terete, glabrous; leaflets thickly chartaceous, elliptic or the smaller ones obovately elliptic, the larger leaflet nearly 1 dm. long by one half as wide across the middle, apex rounded and minutely emarginate, base obtuse for the terminal ones, the lateral inequilateral and somewhat cuneate, glabrous, the entire margins curved upon the nether side, the smallest leaflets only 2 cm. long; midrib raised beneath, flat on the upper side; lateral nerves 6 to 9 pairs though frequently with secondary intervening ones, divaricate, strict, edge, much less conspicuous, equally plain from both sides, their ends forming a submarginal vein 3 mm. from the reticulations conspicuous on both sides. Inflorescence 5 to 8 cm. long, ascending, axillary, solitary, glabrous, branched from above the middle; lower branches divaricate, 1 to 3 cm. long or longer, likewise glabrous, similarly rebranched toward the distal end; flowers yellowish or greenish white, subumbellately clustered from the ends of the ultimate branchlets; pedicels 3 mm. long, faintly puberulent, subtended by very short similarly puberulent bracts, the branchlets also with bracts; calyx persistent, the 4 sepals united at the base, ovately elliptic, 1.5 mm. long, glaucous on the dorsal and densely purplish spotted on the inner side except the hyaline margin; petals alternating with them, free and soon falling, 4 mm. long, one half as wide, truncate at the base, also purplish except the white margins, obtuse at apex and with an inflexed yellow apiculate point, the upper one half strongly recurved in anthesis, glabrous except the brush of long hairs on the upper side a trifle below the middle; stamens erect, alternating, of the same number; filaments 4 mm. long, attached to the base of the ovary, flattened toward the widest basal portion, glabrous; anther ellipsoid, 1.75 mm. long, 1 mm. less in width, the basal portion divided, versatile, laterally dehiscent; ovary 4-celled, densely velutinous, inserted upon a similarly hairy fleshy rim; style thick, strict, 3 mm. long, glabrous except at the very base.

Type specimen number 13216, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This is another shrub from the chaparral summit region of mount Pulgar and collected upon a beautiful May day.

Quite distinct from *E. retusa Merr.* to which it seems most closely related.

Zanthoxylum iwahigense Elm. n. sp.

Scandent shrub and widely sprawling in habit; stem 1 dm. thick, terete; bark brown, obscurely checked, yellowish except the surface; wood rather hard, also yellow, finely grained, that in the twigs possesses a sweet sharp turpentine odor; the main branches provided with stout spines as are also the glabrous twigs. Leaves ascending and frequently recurved, well scattered alternatingly, 1 to 1.5 dm. long, odd pinnate, leaflet bearing from near the base; rachis pale green, glabrous, slightly winged along the upper caniculate side, the petiole proper only 1 cm. long and at the base provided on each side with a sharply pointed yellowish brown shining only slightly recurved spine; leaflets 5 to 7 pairs, flat, shining dark green above, much lighter beneath even in the dry state, unequally brown when dry, the entire or minutely crenate margins curved upon the nether surface, elliptic toward the base, the slightly larger terminal ones ovately elliptic or elongated, the basal portion frequently inequilateral, obtusely rounded and minutely emarginate at apex, broadly rounded at the base or the oblique ones broadly obtuse, the larger ones 5 cm. long by 2 cm. wide below the middle, the basal leaflet frequently only one half as large; midrib raised beneath, deeply caniculate above; lateral nerves 5 to 7 on each side, divaricate, very faint, tips united, reticulations none. Inflorescence ascendingly spreading, green and glabrous and terminal and usually upon few to several peduncles; stalks 3 to 5 cm. long, nearly twice as long in the fruiting stage, strict, glabrous, winged umbellately branched: the fruiting branches very unequal in length, also straight and angular, the longer 3 cm. in length, flower bearing toward the distal ends; buds cinereous, 1.5 m. long, rugose, the 5 sepals greenish, very short and thick, the 5 alternating petals 3 times as long and whitish; anthers not detected; ovary with black hood-like sessile stigmas 1 mm. long, 2-lobed, glabrous, obscurely compressed, 2-celled. Fruits atropurpureus, subglobose, creased and bi-carpellary, sessile or upon short unequally long pedicels, 3 to 5 mm. in diameter, generally with 2 shining black meanderingly marked seeds.

Type specimen number 12751, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Inhabiting the jungled woods along the Iwahig river at about 250 feet above sea, in a shallow red soil over the deep gravelly subsoil.

Differs from *Z. crenulatum Merr.* in having sharp spines and more pairs of leaflets.

SANTALACEAE

Henslowia palawanensis Elm. n. sp.

A scandent and sprawling shrub; stem terete, 5 cm. thick, smooth and bendable; bark reddish brown beneath the dull gray checked surface; wood soft, porous, whitish, odorless and tasteless; branchlets numerous, green, brittle or at least rigid and breaking with a snap, also terete, glabrous. Leaves rigidly coriaceous, the entire edges with sides somewhat concave beneath, alternate, drying dull brown on both sides, paler green beneath, obovate to elliptic or even ovate, the average ones 6 cm. long by 3.5 cm. across the widest portion, apex occasionally obtuse but usually rounded, base short cuneate; veins 3 to 5, the midvein most conspicuous, the lateral pair frequently with a lateral veinlet or more along the outer side, reticulations none; petiole 6 to 10 mm. long, thick, compressed, shallowly grooved above, the basal portion of the blade conduplicate. Fruit axillary, solitary or in small clusters, upon very short pedicels, ovoidly globose, 8 mm. in diameter, glabrous, red and ultimately nearly black, sour to taste, rugose in the dry state and crowded by the persistent calyx teeth.

Type specimen number 12752, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In thickets and spreading over woods along the Iwahig river at 250 feet altitude, in reddish shallow surface soil with a deep gravelly subsoil.

SAPOTACEAE

Sideroxylon velutinum Elm. n. sp.

Tree of medium stature; stem 3 dm. thick, 12 m.

high, subterete, with a few ascending branches arising from below the middle; wood burly, quite heavy, dingy white, odorless and tasteless; bark thick, dirty brown and smooth or scaling in small thin plates, otherwise testaceus, the inner side with milky sap; limbs widely spreading, ultimately freely rebranched; the twigs flexible, subterete, the green terminal portion obscurely angular and subglabrous. Leaves alternatingly scattered toward the distal ends, subchartaceous, horizontally spreading, flat or shallowly folded upon the shining dark green and glabrous upper side, the younger ones soft velutinous and isabellinus beneath, with age the the color becomes grayish, margins entire, apex acute to acuminate, cuneate at base, oblong, the blades 2 dm. long by 7 cm. wide a trifle above the middle, drying unequally brown or gray on the two sides; midrib raised and grayish brown beneath, flat on the upper surface; lateral nerves obout 9 pairs, oblique, prominent beneath, tips very faint and obscurely united, the fine reticulations more evident from the upper side; petiole 3 cm. long, deeply caniculate. Flowers caducous, sour dough in odor, greenish white, fascicled from the leaf axils or from their scars; pedicels 3 to 5 mm. long, at the base subtended by a series of short brown sparsely pubescent bracts, subcinereous; perianth of 5 imbricated segments; the outer 2 very coriaceous, concavo-convex, appressed pubescent or grayish tomentose, orbicular, 3 mm. across; the 3 or by chance as many as 5 inner ones very finely striate, glabrous, margins hyaline and minutely ciliate; stamens 5, opposite the petals; filaments glabrous, blackish brown in the dry state, 1 to 2 mm. long, inserted upon the basal portion of the inner petals; anther ovately oblong or elliptic, 1.5 mm. long, basifixed, obtuse at the usually emarginate apex, base broadly rounded and cordate, the connective rather large; ovary one half imbedded, the conically flattened surface terminated into a 2 mm. long ridged nearly glabrous stout point, surrounded by short membranous folds or glands densely provided with hairs; ovules few to several.

Type specimen number 13130, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Inhabiting the Iwahig river banks at 250 feet altitude and extending part way over the bed of the river, in clay packed with stones.

Apparently very near to *S. glomeratum Volk.* from the Caroline islands. Forestry Bureau number 11518 collected by *Dr. H. N. Whitford* in the province of Camarines, Luzon, is the same species.

Sideroxylon foxworthyi Elm. n. sp.

A middle sized tree; stem 3 dm. thick, 10 m. high, subterete, its main branches arising from above the middle; wood hard, tough or burly, bitterish, odorless, the sapwood white, the central mass turning roseus; bark smooth, grayish mottled, the inner portion latericius and usually with latex; branches forming an elongated crown, the twigs rather slender and ascendingly curved, terete, the terminal portion ridged and latericius short tomentose. Leaves alternate, along the distal ends only, horizontally spreading, rigidly chartaceous, flat, dark green and latericius, tomentose or scurfy on the upper side but soon wearing glabrous, beneath densely covered with similar short hairs, margins entire but curved upon the nether side in the dry state, apex rounded and short pointed or broadly cuneate at base, elliptically elongated, 18 cm. long without the petiole, 7 cm. wide across the middle; midvein very stout beneath and similarly pubescent, caniculate and glabrous on the upper side; lateral nerves pinnate, about 15 to 17 pairs, divaricate, only the very tips ascendingly curved, similar in vestiture and relatively prominent beneath, cross bars very fine; petiole also latericius pubescent, caniculate, when old turning cinereous, 2 to 3 cm. long. Flowers quite densely clustered in the leaf axils or in their scars, spreading, richly latericius short woolly; pedicels 1.5 cm. long, similarly pubescent, subtended by pubescent rather short and rounded persistent bracts; calyx of about 5 unequal segments, densely brown hairy on both sides, 3 to 4 mm. long, the outer or larger ones rotund, the inner ones more elongated and with infolded edges along one side, more or less united at the base; corolla glabrous, forming a cylindric tube, caducous, nearly 5 mm. long; the lobes 1 to 1.5 mm. wide, truncate at apex, about 2 mm.

long, erect, 5 in number although alternating with these are much reduced linear laminae; anther 1 mm. long, triangular, faintly mucronate at apex, basifixed, opening laterally from the base; ovary 3.5 mm. wide, flatly globose, densely hirsute; style about as long and glabrous, gradually tapering from base toward apex; ovules 5, subpendant from a central placenta.

Type specimen number 12824, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In good well drained soil of a forested ridge at 1000 feet altitude. Named after *Dr. F. W. Foxworthy* who has made one of the first exploration trips to Palawan island.

SIMARUBACEAE

Picrasma philippinensis Elm. n. sp.

A small erect tree; stem terete, 2 dm. thick, 8 m. high, its main branches arising from the middle; wood quite soft, bitter, odorless, light, dingy white; bark grayish or yellowish white mottled, cremeus except the smooth epidermis; main branches ascending, numerously rebranched, the branchlets very lax and nearly castaneus. Leaves ascending or horizontal, alternate, 5 foliate, the 3 to 5 cm. long petiole as well as the slightly shorter rachis terete and glabrous; petiole less than 5 mm. long for the lateral ones, the terminal one 2 cm. in length, glabrous and in the dry state dark reddish brown especially at the end and base; stipule glabrous, green, broadly rounded, deciduous; leaflets oblong or the smaller ones broadly lanceolate, submembranous, very dark yet shining green above, glabrous, entire or undulate toward apex, much paler or relatively yellowish green beneath, nearly flat, the abrupt acuminate apex recurved, base obtusely rounded or cuneate for the terminal leaflet, the lower pair usually smaller and the whole lower leaves reduced, 4 by 10 cm. in size for the larger ones, curing unequally avellaneus; midrib conspicuous beneath, with 5 to 7 ascendingly curved lateral pairs of nerves, reticulations obscure. Inflorescence ascending from the terminal leaf axils, the peduncle exceeding the petiole, lax, deep green, glabrous, 1 to 2 dm. long, branched from the middle, less in width, distichously branched, few flower bearing toward the distal end, the ultimate branchlets very short and thickened at the ends; pedicel also glabrous, slender, 1 cm. long, gradually enlarged; calyx comprised of 4 short triangular leathery teeth, 1 mm. in length, glabrous; petals 4, valvate, forming a subglobose bud, very thick, also glabrous, 5 to 6 mm. long including the concrete base, ovately oblong or elliptic, with an acute apex, the thin marginal portion inflexed, subequal, the larger ones usually depressed along the median line from the back; stamens 4, alternating with the petals; filaments inserted around the ovary, 1.5 mm. long, fusiform, glabrous and pointed at the distal end, short hirsute; anther ovate, deeply divided at the base, basifixed, 1.25 mm. long, very minutely papillose, the cells opening laterally upon the ventral sides; ovary finely hispid, imbedded, the exerted portion irregularly rugose and flatly conical, terminated by 4 lighter brown puberulent sessile stigmas.

Type specimen number 13094, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered on seepage ledges covered with a thin layer of earth along a densely wooded creek of a deep ravine at 750 feet altitude.

There are a number of distinct characters distinguishing it from *P. javensis Blm.* What *P. nepalensis Benn.* is I do not know.

SOLANACEAE

Solanum sparsiflorum Elm. n. sp.

Perennial herb; stem green, crooked, spiny, 1 m. long or less, rebranched all along from near the base, the young tips stellately hairy. Leaves opposite or occasionally alternate, variable as to size and lobulation, in general outline elliptic or ovately oblongish, the smaller ones nearly entire, the larger ones 5 to 8 cm. long without the petiole and by 3 to 4 cm. wide across the middle or a trifle below it, apex bluntly obtuse, base broadly obtuse and oblique or subtruncate, the larger lamina with 2 to 3 roundish shallow lobes on each side, submembranous, paler green beneath, flat, strigose on the upper side, stellately pubescent beneath; midvein more evident on the lower side, here and there with a minute spine along both sides; lateral nerves with about 3 on each side, divaricate, quite obscure on the upper side, coarsely reticulate toward their ends; petiole slender, stellate, 1.5 cm. long, usually spiny along the lower side. Flowers generally solitary along the branchlets or in the leaf axils, ascending, similarly hairy, 1.5 to 2 cm. long, in the fruiting state thickened toward the distal end; calyx 6 mm. long, the basal shallow cup shaped part united, glabrous on the inner side, the basal exterior provided with unequal spines, only the dorsal surface provided with spiculate pubescence; the 5 lobes unequal, midvein conspicuous, reticulations very evident, apex slenderly acuminate and rolled in upon the ventral side, submembranous, yellowish green, rotately spreading in full anthesis; corolla 5, more membranous, 1.25 cm. long, the basal one third glabrous and broadly tubular; lobes 7 mm. long, triangularly lanceolate, subhyaline except the nerves, gradually tapering toward the obtusely pointed apex, short stellate pubescent on the back side, the side toward the base usually folded upon the ventral surface; stamens also 5, inserted upon the basal part of the corolla tube, glabrous, flattened, 2 mm. long; anther erect, 5 mm. long, linear lanceolate, compressed, truncate at both ends, 1 mm. wide at the base, dehiscing through apical pores; ovary 2 mm. long, short elliptic, broadly compressed, deep brown, glabrous, bearing 2 short divergent stigmas; ovules numerous. Berry short ellipsoid, 1.25 cm. long, well surrounded by the much enlarged calyx which bears sharp black spines along their ridges or median lines, greenish white.

Type specimen number 13157, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in sticky soil of small open patches of herbaceous thickets in a densely forested region along the trail to Napsan from 500 to 750 feet altitude.

Apparently related to *S. biflorum Lour.*

STERCULIACEAE

Pterospermum perrinii Elm. n. sp.

A medium sized tree; stem 3 dm. thick, crooked, terete. 10 m. high, branched mainly at the top; wood light, soft, its sapwood only thin and white, otherwise pale roseus or the color of the wood in lead pencils, odorless and tasteless; bark thick, nearly atropurpureus except the smoothish or only obscurely checked gray epidermis; branches spreading, slender, soft as leather in texture, the younger portion densely isabellinus tomentose. Leaves alternate, scattered, horizontal or descending, curvingly folded upon the upper deep green surface which turns black while drying, apex broadly rounded but terminated by very short and abrupt acute points, thinly coriaceous, entire, very unequal in size, glabrous above, densely isabellinus tomentose on the nether side, usually unequilateral and truncately rounded or subcordate at base, ovately to truncately elliptic or subrotund, usually widest toward the base but occasionally above the middle, the larger lamina 7 by 10 cm. yet the terminal ones frequently less than one half as large; midrib conspicuous and similarly tomentose beneath, shallowly grooved and glabrous obove; the lateral nerves 5 to 7, very oblique and parallel, similar in vestiture, the basal pair with several sublateral nerves on the outer or lower side, the cross bars faint yet evident from both sides; stipule less than 1 cm. long, unequally sagittate at the broad base, apex acute, deciduous. Flowers usually solitary from the leaf axils, nearly odorless, upon 1 to 3 cm. long tawny tomentose stalks; calyx contracted into a 1 cm. long fulvus scurfy stipe; segments valvate, 5, flavo-virens above, fulvus scurfy beneath, spliting from apex to the base, 4.5 cm. long, nearly 4 mm. wide, leathery, linear, gradually tapering toward the acute apex; buds almost 5 cm. in length, subtended by caducous bracts; stalk of the sex organs 7.5 mm. long, 2 mm. thick, glabrous, slightly enlarged toward the basal concrete portion; petals deciduous, creamy white, strongly twisted and imbricated, 3 to 5 cm. long, glabrous, oblong, narrowed toward the free base, 5 to 8 cm. long; stamens of the same color, about 20, arising from the basal portion of the ovary; filaments very unequal in length, nearly free, glabrous, curvingly interlaced, subterete and narrowly linear; the 4 or 5 longer filaments 1.5 to 2 cm. long, the distal one half conspicuously glandular, the shorter filaments eglandular; anther basifixed, linearly oblong, 2 mm. long; ovary 4.5 mm. long, ellipsoid, slightly rugose, longitudinally, densely tawny pubescent; style glabrous, curved, 2.5 cm. long, clavately linear toward the distal flavo-virens colored stigmatic end, spirally striate at about the middle and above it.

Type specimen number 12841, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in loose or sand stony soil of a steep densely wooded stream depression at 1500 feet altitude. Named with pleasure after *Mr. J. Louis Perrin*, collector of customs for the port of Balabac.

SYMPLOCACEAE

Symplocos pulgarensis Elm. n. sp.

A medium sized tree; stem terete, 4 dm. thick, 12 m. high, its main branches arising from above the middle; wood cremeus especially the central mass, odorless and tasteless, moderately soft; bark brown to gray, smooth or only minutely checked, whitish on the inner side, cremeus in the middle region; the branches numerously rebranched; twigs lax, ascending, glabrous, greenish, forming dense masses, relatively short. Leaves horizontal, folded upon the darker green and sublucid upper surface, strongly recurved at their acute to acuminate points, cuneate or narrowly obscure at base, entire, glabrous, curing equally dull green on both sides, broadly oblanceolate, alternate, 8 cm. long by 3 cm. wide a trifle above the middle, occasionally much smaller, copious; midrib ridged beneath, finely grooved above, glabrous; the 7 to 9 lateral pairs relatively very obscure, divaricate, the tips much ascending and archingly recurved, the few reticulations not very evident; petiole 1 cm. long, flattened and grooved along the upper side, greenish brown in the dry state, also glabrous. Infrutescence chiefly from the uppermost leaf axils, ascendingly spreading, less than 5 cm. long, occasionally short branched toward the base, glabrous, all the stalks pale green and glabrous; pedicels 5 mm. long or less, alternating, leaving grayish scars after falling; fruits ovoidly ellipsoid, light green, 7.5 mm. long by 6 mm. thick below the middle, brown when dry, apex blunt and terminated by the light gray minute 5 calyx segments, with a single smooth yellowish stone seed.

Type specimen number 12979, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

As near to *S. polyandra (Blco.) Brand* as to any of our Philippine species.

THEACEAE

Thea megacarpa Elm. n. sp.

A strict slender tree; stem terete, 1 dm. thick, straight, 7 m. high or higher; wood hard and quite brittle, dingy white on the outside, the central bulk melleus; bark smooth, yellowish gray, forming an elongated crown toward the top only, freely rebranched; twigs terete, brownish, glabrous and smooth. Leaves ascending or horizontal, flat, rigidly coriaceous, very deep green above, much paler beneath, curing green on both sides, well scattered alternatingly, oblongish or subelliptic, with obtuse to subacutely pointed ends, margins entire or very minutely apiculate toward the apex and in the dry state somewhat curved upon the lower side, glabrous, appearing puberulent beneath, 11 to 16 cm. long, 4 to 6 cm. wide across the middle or a trifle below it; petiole 1 to 1.5 cm. long, deeply grooved along the upper flattened portion, leaving conspicuous scars after falling; midvein stout beneath, deeply caniculate along the upper surface; lateral nerves obscure beneath but evident on the upper side, oblique, rather fine, reticulately united with their ends, from 6 to 9 pairs; bud bracts strongly imbricate, glabrous except the finely ciliate margins, drying blackish brown, coriaceous. Fruits terminal, usually solitary, subpendant from 1 to 2 cm. long ligneus stalks, compressed globose, 5 cm. across, hard, isabellinus, dehiscing into 3 thick carpels from apex toward base, puberulent in the young state, subtended by the thick finely hairy 3 sepals, loculicidal, the relatively thin partitions forming a central triangular column; seeds irregularly triangular, 1 5 cm. across or long, musty brown when dry, attached to the central placenta by the circular lighter brown base, usually 5 in each cell.

Type specimen number 12822, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered upon a forested ridge at 1000 feet altitude, in well drained red soil covered with dry foliage. Quite rare!

Schima pulgarensis Elm. n. sp.

Interlaced shrub; ultimate branchlets numerous, suberect, terete, glabrous, roughened by the leaf scars. Leaves alternatingly crowded toward the ends of the twigs, ascending, glabrous, chartaceous, conduplicate and usually recurved, elliptically oblong, the average blades 6 cm. long by one half as wide across the middle, apex usually obtuse to acute, occasionally rounded or acuminate, base broadly obtuse to rounded and entire, the margins otherwise crenately serrate; midvein stout beneath, flat on the upper side, the 6 to 9 lateral ones relatively very faint, barely distinguishable from the minute yet very evident reticulations of both sides; petiole stout, less than 1 cm. long, compressed or broadly flattened on he upper side, glabrous, leaving large scars after falling; bud bract 5 mm. long, conically pointed, densely cinereous. Flowers usually solitary from the upper leaf axils; pedicels also glabrous, erect or ascending, stout, 1 to 1.5 cm long, thickened at the distal end; calyx very thick and rigid, cupular, glabrous on the outside, densely ciliate along the margins, appressed canescent on the inner side toward the base, oval, more or less 2.5 mm. across, imbricate, broadly rounded; petals 5, broadly obovate or subrotund, abruptly narrowed or clawed at the base, united and forming a short thick tube at the base, puberulent on the outside of the tube, otherwise glabrous with age or only ciliate along the margins, quite veiny; filaments 2 to 4 mm. long, fleshy, terete, promiscuously inserted upon the thickened portion near the corolla orifice, the basal part glabrous but grayish toward the distal end; anther broadly elliptic, 1.5 mm. long, notched at both ends; style 1.5 mm. thick, 4 mm. long, terminated by a rugosely 5-lobed flattened stigma; ovary 3.5 mm. wide, also flattened, terete, short and densely tomentose, apparently 5-celled.

Type specimen number 13191, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected upon the summit or at 4250 feet altitude of the mountain after which it is named. *Messrs. Curran* and *Foxworthy* have also collected it on the same mountain.

Critically distinguished from *S. noronhae Reinw.* by its much thinner leaves with less entire margins and whose reticulations are very evident from both sides.

THYMELEACEAE

Wickstroemia pulgarensis Elm. n. sp.

Low and spreading shrub; branchlets rather short, crooked and interlaced; bark smooth, ater in color. Leaves opposite, coriaceous, glabrous, elliptically oblong, the larger blades 4 cm. long and nearly 2 cm. wide across the middle, obtuse at base, obtuse or subacute at apex, the entire margins curved upon the nether side at least in the dry state, curing dull brown on both sides, the smallest blades one fourth as large; midrib raised beneath, narrowly caniculate above; lateral nerves very obscure, strictly ascending clear into the margins, 7 to 11 on each side, reticulations none; petiole at most 3 mm. long, likewise glabrous, broadly channeled along the upper side. Flowers lost, arising from the uppermost leaf axils, solitary; the pedicel very slender, glabrous, recurved, 2 cm. long or less in length.

Type specimen number 13203, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected on a beautiful May day in the shrubby chaparral summit vegetation at 4250 feet altitude of the mountain whose name it bears.

Possibly it belongs to the genus *Daphne Tourn.*

ULMACEAE

Gironniera sibuyanensis Elm. n. sp.

A lax undershrub; stem 3 to 4 m. long, branched from below the middle; branchlets lax and numerous, the younger ones densely covered with strigose hairs; wood pale white, odorless and tasteless, rather hard; bark roughened with lenticels or longitudinally becoming checked, dull brown or grayish. Leaves alternatingly scattering, chartaceous, diverse in size, flat or only the slenderly acuminate to caudate tips recurved, much lighter green beneath, drying grayish brown, the average lamina 5 by 15 cm., unequally sided, obtuse at base, the margins except around the base denticulate, oblong, both sides appearing minutely blistery, glabrous except the very sparse ciliate hairs especially along the appressed nerves beneath, the young ones strigose on both sides; midvein prominent beneath and appressed hairy; lateral pairs 7 to 11, also prominent beneath and likewise hairy, ascendingly curved, the tips reticulately united, reticulations numerous and relatively prominent beneath; petiole stout, 1 cm. long or much less, densely strigose when young, scaly or becoming checked when old; stipules caducous, 1.5 cm. long, 4 mm. wide, slenderly acuminate, strigose on the back, glabrous and finely striate on the inner side. Infrutescence axillary or lateral, upon loose few fruited glomerules; peduncle and pedicel short, strigose or subglabrous, usually few branched, articulate at the point of branching, relatively thick, subtended by bracts or bracteoles; bracts hairy on the back, 1.5 mm. long, broadly triangular, apex acuminate, yellowish, sides hyaline, subpersistent, unequal in size, midrib keeled; calyx persistent, very short and rim-like, obscurely 5-dentate, the apical dorsal portion puberulent, well attached to the ovary; pistillate flower solitary or few from the distal end, subtended by similar bracts; ovary compressed, hirsute, elongated and tapering from the base toward apex, becoming much broadened with age; stigmas of 2 linear forks 5 to 8 mm. long, curved and twisted, slightly hairy, united at the base. Fruits 5 mm. long, flattened, ovate from the side view, sessile, subtended by minute persistent bracteoles, when young green and strigosely pubescent, turning yellowish and finally flesh red as well as becoming entirely glabrous and somewhat juicy.

Type specimen number 12077, *A. D. E Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, March 1910.

Collected along brooks of dense woods in loose stony soil at 1750 feet altitude on the España side of the divide.

Gironniera celtidifolia Gaud. is based upon *Cuming's* number 870 and which is an exact match for my number 7084 from the lowlands of Leyte. This same species the writer found very common in the rich forested flats of Surigao peninsula. My number 7388 from the subalpine region of Mount Banahao on the Lucban side is the same species as here described.

URTICACEAE

Elatostemma pulgarense Elm. n. sp.

Creeping and somewhat succulent herbs; stem 3 to 5 dm. long, branched, the ultimate ones suberect, dark green, glabrous, taking root at the basal joints. Leaves usually toward the distal end, subcoriaceous, ascending or horizontal, glabrous, flat, dark green on the upper side even so in the dry state, densely covered with minute cystaliths, alternate from the slightly zigzag distal end of the branchlets, the larger ones nearly 1 dm. long and 2 cm. wide across its widest portion, oblanceolate or oblong, a trifle inequilateral, the acuminate apex subfalcate, the obtuse base more distinctly inequilateral, much paler green beneath even in the dry state, entire; midrib brown and glabrous beneath, usually with an unequally prominent lateral basal pair and an extra one a little further up, all of these running nearly parallel with the leaf edges and connecting with the 2 to 3 faint divaricate pairs, reticulations none; petiole 3 to 5 mm. long, glabrous, brown when dry; stipules oblong, hyaline, exceeding the petioles, caducous. Inflorescence axillary, the staminate slenderly stalked, the pistillate sessile or subsessile, odorless; heads 1 to 1.5 cm. wide, sessile in the leaf axils, much flattened, parted, subtended by 2 involucral bracts, composed of 4 subsidiary erect heads; outer bracts 5 mm. long, nearly twice as wide, truncate and becoming irregularly fimbricate, hyaline except the slightly green middle region, entirely glabrous, the darker green median line extended into a flattened point some little distance below the edge; secondary involucre similar except much narrower; the 5 to 8 flowers in each group subtended by a series of imbricating hyaline and unequal bracteoles; perianth segments 4, well enveloping the staminate flowers, hyaline, elliptic or oblongish, 2 mm. long, united at the base, pointed from near the apical dorsal side; stamens 4, the 0.5 mm. long filament barely visible; anthers 1 mm. long, oblong, lobed especially at the basifixed base; pistillate flowers not seen.

Type specimen number 13205, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Growing in a humid densely forested stream depression at 2000 feet altitude.

VERBENACEAE

Clerodendron curranii Elm. n. sp.

Erect and slender shrub or tree-like; stem 5 to 8 cm. thick, 5 to 8 m. high, only sparingly branched from below the middle; wood very soft, white, tasteless, with a slight greenish or foetid odor, pitn large and white; bark very smooth, brown and grayish white mottled, green beneath the epidermis; branches crooked, sparingly rebranched, ascending, the slender ultimate ones greenish and angular, densely avellaneus tomentose. Leaves opposite, scattered, the blades descending, soft membranous, a trifle paler green beneath, the upper ones reduced, 2.25 dm. long without the petioles, 16 cm. wide across the basal one half, velutinous pubescent on the upper surface, softly pubescent beneath, broadly rounded and cordate at base, usually gradually tapering to the acute or acuminate apex, entire or irregularly dentate along the sides toward the apex, curing yellowish brown on both sides; midvein straight and stouter than the 4 to 6 lateral ascending pairs, the basal or stronger of the lateral pairs with as many sublateral ones from the lower outer side only, cross bars also prominent, reticulations obscure; petiole

1 dm. long, short but densely tawny hairy, shorter in the smaller leaves. Panicle terminal, erect, the green and tomentose angular 5 to 8 cm. long stalks subtended by foliaceous bracts; the branches opposite, the lower ones longer, subtended by caducous bracts, all light olivaceus tomentose, rebranched above the middle, forming a corymbose panicle, the ultimate branchlets short and few, flower bearing at their ends; terminal flower solitary, odorless, upon 1 cm. long pedicel, the pedicels of the few clustered lateral flowers shorter, all subtended by linear densely tomentose early falling bracts; calyx slenderly turbinate, 1.5 cm. long, about one half as wide across the top, puberulent on the exterior and on the ventral side of the segments toward the apex, much paler green; sepals 5, subequal, at least one half the entire calyx length, oblongish but slenderly tapering toward the acuminate to subcaudate point, 3 mm. wide, reticulately veined, with few large glands in the middle region of the ventral side; corolla creamy white except the purple throat, 2.5 cm. long, the basal two thirds tubular and puberulent on the exterior except at the base, the tube strongly striate on the exterior, the distal bud portion a trifle tipped and obovately oblong; lobes ultimately widely preading, occasionally gland punctate, oblong-more narrowed toward the base, 8 mm. long, 3.5 mm. wide, apex obtusely rounded to acute, faintly puberulent toward the apex on the dorsal side and along the distal edge, the margins below the middle undulate or obscurely and irregularly dentate; stamens 4 or more, inserted upon the corolla throat, 2 cm. long, glabrous, usually curved toward the distal end, strongly looped in the bud; style articulate to ovary, very similar to the filaments, subcompressed and laterally grooved, cremeus though greenish toward the distal end; anthers elliptic, 2.5 mm. long, 1.25 mm. wide, the basal one half more tapering and sagittately lobed, subdorsifixed, truncately rounded at apex, compressed, drying blackish brown; ovary glabrous, short but thick columnar, upon a constricted base, with a very deep green stigma.

Type specimen number 12860, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Forming extensive copses in good well drained ground among light woods bordering cogon patches at 500 feet altitude along the trail to Napsan. Named after *H. M. Curran*, an exforester in the Philippine government service and who has also collected it on Palawan.

Only critically distinguished from *C. infortunatum* (*Roxb.*) *Linn.*

VIOLACEAE

Rinorea pulgarensis Elm. n. sp.

Suberect shrub; wood closely grained, white except the dingy yellowish central portion, odorless and tasteless; bark smooth, gray except the testaceus inner portion; stem 5 to 8 cm. thick, terete, 3 to 4 m. high; its main branches from below the middle, crookedly rebranched, widely spreading, the lax twigs puberulent at the young green tips. Leaves horizontal or descending, thinly coriaceous, flat, dark green and glabrous above, very much lighter beneath, the young ones pleasing light green, the two sides very unequally brown in the dry state, apex slenderly acute to acuminate, base broadly obtuse to subcuneate, diverse in size, the smaller ones lanceolate, the larger blades narrowly oblong and 4 by 15 cm. in size, margins entire; midvein pronounced beneath and finely caniculate along the upper side; lateral nerves 7 to 9 pairs, oblique, the tips united a mm. below the edge of the leaf, reticulations minute and quite evident on the nether side; petiole 5 to 8 mm. long, glabrous and caniculate, becoming scurfy with age; bud bracts short and tawny pubescent. Flowers occasionally solitary but usually in small groups upon short pubescently bracteated green stalks or tubercles; pedicel short, similarly bracteated; calyx campanulate, leathery, appressed puberulent on the exterior, ovately 3 to 4-segmented, the basal one third united, the apex broadly rounded, 3.5 mm. long including the concrete base; corolla ovoidly cylindric, 5 mm. long, similarly puberulent on the exterior, rigidly coriaceous, the apical 2 mm. 3 to 4-lobulate; the lobes short, ovate in outline, subauriculate at the basal sides, usually somewhat folded and slightly curved toward the obtuse apex; stamens in pairs, about 7 or 8, included; filaments much flattened, glabrous, falsely united to the basal portion of the corolla, at least 1 mm. long; anther acuminate, compressed, the connective thick and reddish brown, the lateral cell walls hyaline after anthesis, basifixed, the upper or terminal one 1.25 mm. long, the lower or ventral one a trifle shorter; ovary glabrous, 1.25 mm. wide, much flattened, the edges obscurely 8-pointed or merely rugulose, tapering into a very short point.

Type specimen number 12839, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found in gravelly soil packed between bowlders along a densely wooded stream at 1500 feet altitude.

Alsodeia formicaria Elm. n. sp.

A slender erect tree; stem 1 dm. thick, terete, branched above the middle, 8 m. high; branches laxly rebranched, forming a loosely spreading crown; wood quite heavy and hard, ochraleucus especially the central portion, odorless and without taste; bark white except the smooth grayish epidermis; the green portion of the slender twigs glabrous. Leaves alternatingly scattered, thickly coriaceous descending, nearly flat, much deeper green on the upper surface, glabrous, curing equally dull brown on both sides, the abrupt sharply acuminate point recurved, obtuse or obtusely rounded at base, the young ones very pale green, entire, the larger lamina 15 cm. long by nearly 5 cm. wide above the middle, usually obovately oblong though frequently merely oblong, the smaller leaves broadly oblanceolate; the midrib quite prominent beneath and fluted along the upper side; the lateral nerves 5 to 8 on each side, likewise conspicuous beneath, strongly curved from the base, tips reticulately united, the reticulations quite evident from beneath; petiole 5 to 8 mm. long, glabrous, blackish when dry. Inflorescence horizontal, spreading from the leaf axils or from their scars; the spikes usually solitary, 1 to 2 cm. long, short bracteolate, very short and few branched or not at all, all the stalks thick and rigid, subglabrous; the small sessile deflexed flowers pale green; sepals 5, slightly imbricate, ovately elliptic, 1.5 mm. long, less than 1 mm. in width, leathery and quite rigid, obtuse at apex, united at the base, puberulent on the outside only;

petals alternate with the sepals, linear, truncately rounded at apex, almost 2 mm. long, the dorsal median region puberulent, margins much thinner and glabrous as well as the inner side; stamens inserted from around the basal portion of the ovary; filament compressed, 0.2 mm. long, glabrous and dark reddish brown when dry; anther pale yellow, also erect, basifixed, nearly 1 mm. long including the hyaline and minutely emarginate upper one half or more; anther cells only one third as long, auriculate at the base and dehiscing laterally; ovary elliptically elongated, glabrous, 0.5 mm. long, the style twice as long and bearing a minute stigma. Fruits pendant, strongly reticulate when mature, green and soft in texture, elongate ellipsoid from the side view, 2.5 cm. long at least, roundly 3-angled, the carpels splitting open from the circular aperture toward the base; seeds immature, globose, whitish, smooth, 2 to 3 along each carpellary suture.

Type specimen number 12886, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Of this remarkable species only one plant was discovered in the red compact soil of the humid forests at 750 feet altitude. The hollow and somewhat bladdery capsular fruits usually are filled with small black ants who find it an easy way of passing in and out through the apical orifice.

VITACEAE

Leea palawanensis Elm. n. sp.

Laxly branched shrub, 3 m. high; branches spineless, glabrous, greenish and numerously provided with yellowish gray excrescences or coarse lenticels. Leaves triangular in outline, 2 to 3 compoundly branched, alternate, the terminal ones 3 to 5 dm. long including the petiole; petiole 1 to 2 dm. long, 5 mm. thick, subterete, thickened at both ends, glabrous, only sparsely lenticelled, the upper basal portion chipped and grooved; the basal pair of branches 2 dm. long, also compound, the rachis of all nearly smooth, glabrous, the terminal portion longer and subcompressed; leaflets 5 to 9; opposite, glabrous, subchartaceous, blackish in the dry state, elongated, the lateral one a trifle wider toward the base, the terminal one widest at the middle or above it, the larger or basal blades 1 dm. long by 3 cm. wide toward the base, frequently much smaller, serrately toothed except around the obtusely or broadly rounded base, apex abruptly terminated into an acuminate point; lateral petiolule 5 mm. long, the terminal one 2 to 3 times as long, glabrous, caniculate, similar in color to the blade; midrib stout beneath, narrowly grooved above; lateral nerves 7 to 10 on each side according to the size of the leaflet, divaricate and ascending, conspicuous beneath, tip barely united, reticulations very faint beneath only. Inflorescence terminal or leaf opposed, erect, 1.5 dm. to 2 dm. long, forming a rather dense corymbose panicle; peduncle 5 to 8 cm. long, terete, coarsely lenticelled, branches compressed and grooved along the edges, divaricate, the lower or longer ones 5 to 8 cm. in length, similarly branched from above the middle, the ultimate ones numerous and short, subtended by caducous bracts and bracteoles; calyx shallowly cup shaped, glabrous, nearly 3 mm. across, the 5 teeth subequal and triangularly obtuse, rigidly coriaceous, basal two thirds united; petals valvate, truncately rounded in the bud state, 5 in number though frequently somewhat unequal, 2 to 3 mm. long in anthesis, thickly coriaceous, obtuse at apex and with a thickened incurved point, triangularly oblong, glabrous; stamineal tube or rim carnosus, encircling the ovary, 1.25 mm. high, glabrous, with 5 rounded and emarginate lobes or appendages, each bearing on dorsal side a pair of thin hyaline divaricate membranes; filaments arising from the sinus of the lobed rim, subterete, 0.5 mm. long, dark yellowish brown and glabrous; anthers as long as the rim, basifixed, sagittate at base and narrowly notched at apex, oblong though a trifle wider toward the base; ovary subglabrous and subglobose, 1 dm. in diameter, bearing a short thick glabrous style terminated by a minute stigma.

Type specimen number 13256, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in secondary woods along a slow flowing deep water streamlet of moist rather fertile soil at 50 feet altitude.

Not *L. rubra Blm.*, because main leaf nerves not winged nor crinkled; bracts and bracteoles present on our specimen; segments of stamineal tube truncately rounded not notched. It is probably nearest to *L. manillensis Walp.* but that species has a short brown pubescence on the inflorescence stalks not subglabrous nor with such conspicuous lenticels.

LEAFLETS OF PHILIPPINE BOTANY

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RUBIACEAE FROM MOUNT URDANETA

by

A. D. E. Elmer

ADENOSACME Wall.

Adenosacme mindanaensis Elm.

Field-note:—Suffrutescent; stem branched from near the base, a yard or two long, terete, less than 0.5 inch thick, rather soft and easily breaking; the greenish white wood with a large pith, covered with smooth yellowish bark; branches slender, sparsely rebranched, reclining, with suberect tips; leaves diverse in size, horizontal, membranous, dark green above, much paler beneath; inflorescence terminal, strongly recurved or pendant, the stalks with the bracts and calyx green, the corolla segments pale yellow; young fruits also pendant, greenish, watery and snow-berry white when mature, with numerous ovules or seeds.

Represented by number 13459, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In wet gravelly or sandy soil among bowlders or along seepage banks of the Catagan creek at 1000 feet altitude.

ARGOSTEMMA Wall.

Argostemma solaniflorum Elm.

Field-note:—Suberect succulent herbs; stem terete, dark green, 0.25 inch thick, occasionally few branched toward the top, ranging from 1 to 6 inches in length; leaves descending down hill, thinly coriaceous, dark metalic green above except the light green zone along the midrib, gradually recurved; flowers terminal, in small clusters, pendant, green except the white corolla and yellow anthers, odorless; infrutescence suberect, pale green.

Represented by number 13842, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

In compact wet and humus covered soil of a steep densely wooded slope at 4500 feet altitude of Cawilanan peak. "Anonapong" is the Manobo name.

CHASALIA Comm.

Chasalia membranifolia (Bartl.) Elm.

Field-note:—Erect shrub-like tree; stem 7 inches thick, 25 feet high or less, branched from below the middle, subterete; wood moderately hard, the thin sapwood white, the balance reddish tinged, without odor or taste; bark greenish gray, smooth, latericius except the epidermis; branches rather long, divaricately spreading, freely rebranched; leaves ascending from the green petioles, horizontally spreading and with recurved tips, submembranous, much darker green above; infrutescence ascending, green or orange red when fully mature, the seeds brown.

Represented by number 13389, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

In well drained soil densely covered with humus of a forested ridge at 2500 feet altitude of Giwantanan. "Aliwanacay" is the Manobo name.

Occasionally it is classified as a species of *Psychotria*.

COPTOSAPELTA Korth.

Coptosapelta olaciformis (Merr.) Elm. n. comb. *Randia olaciformis Merr.* in Philip. Jour. Sci. III, 163, 1908.

Field-note:—A looping tree climber; stem 2 inches thick, very irregular, heavy, looping, numerously branched toward the top and forming hanging masses; wood bitterish, murky white, odorless, pulpy; bark smoothish, dull brown, green on the branchlets; leaves coriaceous, descending, curved upon the upper deeper green surface, apex recurved; inflorescence from the longer somewhat drooping branches, erect, the stalks and calyx green; the recurved petals cremeus and also erect; capsules green, compressed, 2-celled, each cell with a fleshy rugosely placental column; seeds numerous, flattened, brown, ciliately winged.

Represented by number 13355, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

On a windy forested ridge at 2000 feet altitude of Giwantanan. "Talotagdund" is the Manobo name.

It seems to differ in a number of details from *C. flavescens Korth.*, primarily in the fruit, calyx lobes and somewhat in the leaves.

GEOPHILA Don

Geophila herbacea (Linn.) Sch.

Field-note:—Trailing herbs; stems flexible, greenish white, terete, branched; petioles erect, similarly colored, blades horizontal, thinly coriaceous, flat, much paler green beneath; flowers from the leaf axils, erect, upon pale green pedicels, the calyx tips deeper green, odorless, pure white; berries shining miniatus, subglobose, bearing the green calyx segments, juicy and with few to several stony seeds, occasionally few clustered.

Represented by number 13325, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Forming dense mats in moist more or less humus covered flats of secondary forests at 500 feet altitude. "Mamalapandan" in the Manobo dialect.

GREENEA W. et A.

Greenea hirsuta Elm. n. sp.

Erect shrub-like tree; stem very irregular or crooked, 1 dm. thick, 5 m. high, its main branches arising from below the middle; wood hard, heavy, yellowish, without odor or taste; bark thin, very dull, grayish on the lax branches; ultimate branchlets or twigs short, suberect, dirty hirsute, generally in threes, the ultimate portion green, subcompressed and olivaceus hairy. Leaves also horizontal, flat, very short acute, submembranous, paler on the nether side, curing unequally brown on the 2 sides, entire, broadly obtuse at apex, subcuneate or broadly obtuse or obovately elongated, very unequal in size, the larger ones 12 cm. long and one half as wide, hirsute on both sides especially along the nerves beneath; midrib prominent beneath, minutely furrowed on the upper side; lateral nerves likewise conspicuous on the nether side, with 6 pairs, oblique, tips much curved but not united, reticulations none but strictly marked in patches on the lighter side only; petiole green or reddish, stout, flattened on the upper side, densely olivaceus long hairy, 5 mm. long; stipules 2 cm. long, 1 cm. wide, membranous, brown, long olivaceus hairy on the outside, flat, broadly oblong, rounded at apex. Inflorescent spikes axillary, horizontal, forked from the middle, greenish but turning red when exposed, the branches recurved, usually solitary from the uppermost leaf axils, slender and bristly hirsute, less than 1 dm. in length, the branches generally curved and flower bearing nearly to the base; flowers secundly arranged along the upper side, suberect, evenly scattered, odorless; calyx sessile, cupular, 2 mm. long, hirsute, undulately truncate, veiny, greenish; corolla more yellow than green, 7.5 mm. long, gradually enlarging from base toward apex, glabrous on the inside, exterior of tube sparsely puberulent, terminated by 4 lobes; segments rotately spreading, subrotund, 1.5 mm. across, with a brush of hairs on the outer middle basal portion, otherwise glabrous; stamens also 4, alternating with the corolla segments; filaments very short, from the throat; anther 2.5 mm. long, erect, introrsely dehiscent, linear, dorsifixed, 0.5 mm. thick, the upper one half exerted and slightly thicker, ends emarginately rounded; style glabrous, few mm. long, forked, the apical stigmatic tips divergent; ovary also glabrous, rim-like.

Type specimen number 13476, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Discovered in stony humus covered soil along forested ridges at 3000 feet altitude of Duros peak and in the saddle beyond it.

The second Philippine species so far known.

HEDYOTIS Linn.

Hedyotis hispida Retz.

Field-note:—Biennial herb; stems numerous, subterete, green or brownish, from a foot to a yard long, unbranched, ascendingly curved toward the ends; roots fibrous, also from the lower joints of the reclining stems; leaves horizontal and flat or creased along the midrib of the upper shining green surface, relatively whitish green beneath; flowers in dense axillary clusters, the calyx green, the stamens and corolla white.

Represented by number 13517, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Inhabiting cogon flats in compact black soil near the Minusuang river at 250 feet. "Bagat" is the Manobo name.

Hedyotis humilis Merr.

Field-note for 14093:—Low suffrutescent plants; stem terete, brown at base, green otherwise, 6 to 10 inches high or higher, branched from the middle or above it, with slender fibrous roots, branches ascending; leaves horizontally spreading, flat, submembranous, dull green above, much lighter green beneath; inflorescent stalk green, ascending, the calyx also green, the corolla white and deciduous.

Represented by numbers 14093 and 14159, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

In wet loose soil along the banks of a streamlet in a very humid deeply forested depression near Masay peak or mount Urdaneta at 6000 feet altitude. The Manobos called number 14093 "Masonahan" and 14159 "Bagtong."

Hedyotis radicans (Bartl.) Miq.

Field-note:—Perennial masses; stems terete, thinner than a slate pencil, greenish, creeping, occasionally branched, taking root at the joints, the distal ends erect or suberect; leaves horizontally spreading, thinly coriaceous, flat and only gradually recurved, much lighter green beneath; flowers erect, in small axillary clusters, calyx green and persistent, the corolla white, stamens of the same color and deciduous.

Represented by number 14122, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Dense masses upon moist humus covered soil in the ravine at 4250 feet altitude of Cawilanan peak. "Hagonoy" is the Manobo name.

HYDNOPHYTUM Jack

Hydnophytum orbiculatus Elm. n. sp.

Epiphytic and insectivorous; bulb 2 dm. across, rugose or obscurely lobed, grayish brown, rather smooth, soft in texture, coarsely honey combed; stems several from the same end, ascending, 5 dm. long or less, terete, the larger ones rebranched, very flexible, the joints roughened by the old leaf scars, 5 to 8 mm. in diameter, the green distal ends glabrous. Leaves coriaceous, pale green, easily breaking, the entire marginal sides somewhat curved upon the lower and slightly paler green surface, opposite, glabrous, rather closely crowded toward the ends, quite variable in size but not in shape, the larger ones 3.5 by 4.5 cm., frequently much smaller, orbicular, subsessile; midrib quite evident from both sides, with 3 or 4 very obscure lateral pairs; stipules brown, short but broad or rim-like, deciduous. Fruits solitary or few in the leaf axils, ascending, dark green, ovoidly elongated, bearing a truncate calyx rim, 5 to 7 mm. long, about 4 mm. thick between the middle and the base, 2-celled, 1 seed in each; mature seeds or pyrenes plano-convex, nearly 5 mm. long and 2.5 mm. wide across the middle, easily separating from the fleshy skin, oblong to elliptic from the side view.

Type specimen number 14046, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, Ocober, 1912.

Upon the larger limbs of lofty trees along a wind swept forested ridge of Giwantanan at 2000 feet altitude. "Cayambato" in Manobo.

IXORA Linn.

Ixora chartacea Elm. n. sp.

A slender tree-like shrub; stem terete, 5 cm. thick, crooked, 3 m. high, few branched toward the top; wood dingy or yellowish white, moderately hard, odorless and tasteless, covered with smooth and brown bark; main branches relatively short, divaricately spreading, few branched and rigid, glabrous even the subterete apical portion. Leaves opposite, scattered, rigidly chartaceous, descending, the entire sides coarsely wavy and the sharply acute to acuminate apex twistingly recurved, glabrous, dull gray or grayish brown on both sides, much lighter or yellowish green beneath, the average blades 2 dm. long by 4 cm. wide across the middle, the larger ones considerably wider, oblong or the smallest ones linearly lanceolate and usually situated at the basal portion of the branchlets, base bluntly obtuse or subcuneate, lucid above even so in the dry state, edges somewhat recurved; midrib raised beneath and ater when dry, shallowly caniculate along the upper side; lateral nerves 8 to 11 on each side, much lighter in color when dry and much less conspicuous, ascending, strict, branched toward the distal end and very coarsely anastomosing, frequently with intervening secondary ones, reticulations coarse and equally plain on both sides; petiole 1.5 to 2 cm. long, much thickened for the basal two thirds and ascendingly curved, subterete: stipule also subchartaceous, 5 mm. long, quite broad and sharply pointed, the basal portion more or less persistent. Inflorescence terminal or lateral and generally solitary; peduncle slender, pendant, 1 to 2 dm. long, flexible, glabrous, deep red in the fresh state, obscurely expanded at the distal branchlet bearing end, at the base subtended by stipular bracts and generally by a pair of ovate to oblongish foliaceous bracts; branches corymbosely paniculate, forming a 5 cm. wide inflorescence; rebranched from below the middle, angularly flattened especially toward the distal ends, articulate at base, the ultimate ones very finely puberulent, all deep red and subtended by rather sharply pointed bracteoles; pedicel 3 or more mm. long, deep red, finely puberulent, articulate at the apex and terminated by a pair of rigid sharply acute teeth; calyx similar in color and vestiture, 3 5 mm. long, 1 cm. less in thickness, slightly narrower at the base, terminated by 4 small teeth; corolla tube 1.5 cm. long, whitish, glabrous; lobes 4, imbricate and twisted in the ellipsoid bud, 6 mm. long, 4 mm. wide, elliptic or oblongish and truncately rounded at apex, rotately spreading in anthesis, ultimately reflexed and sides somewhat curled upon the dorsal surface, white but occasionally tinged with red; stamens also 4, erect from the throat; filaments glabrous, 2 mm. long and nearly 1 mm. broad, alternating with the segments; anthers 5 mm. long, elongated, dorsifixed, tapering to a point, bilobed at base, rather broad across the middle and obscurely flattened; style very slender, as long as the corolla; stigmas greenish, composed of 2 plano-convex fleshy lobes 2.5 mm. long by 1 mm. wide across the middle. Fruits usually 2-celled and 2-seeded, subglobose or wider than long, light purple but drying blackish, 1 cm. in diameter, terminated by the short calyx rim; pyrene circular and short conical, with a deep cavity upon the ventral side.

Type specimen number 13806, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in dry well drained humus covered ground of forested ridges between Duros and Cawilanan peaks at 3500 feet altitude. "Matigandang" is its Manobo name.

Ixora chartacea membranacea Elm. n. var.

Slender erect or suberect shrub; stem terete, crooked, strict otherwise, 3.5 cm. thick, 3 m. high, few branched toward the top; wood rather hard, the thin outer portion white or nearly so, otherwise yellowish, quite without odor or taste; bark brown and smooth or minutely checked, otherwise latericius; branches spreading, occasionally rebranched, the ultimate ones descending, the apical or young portions glabrous. Leaves submembranous, also descending, oblong or seldom broadest above the middle, glabrous, drying very unequally brown on the two sides, generally subfalcate toward the sharply acute and slightly recurved apex, otherwise nearly flat, in few opposite pairs toward the ends of the branchets only, gradually tapering from the middle toward the obtuse base, the larger ones 2.25 dm. long and 5 to 6 cm. wide, the smallest ones less than one half as large; midrib smooth and ridged on both sides; lateral nerves in the larger leaves about 10 pairs, subdivaricate and curved, tips coarsely anastomosingly united, reticulations likewise coarse and very evident from both sides; petiole stout, 1 cm. long, flattened and somewhat rigid along the upper side; stipule subpersistent, less than 1 cm. in length, its rim quite short but with a long setaceous point. Peduncle dull incarnatus, pendant, terminal, very flexible, glabrous, nearly 2 dm. long, solitary, at the base subtended by stipular bracts and generally with an additional foliaceous pair; branches forming a corymbose panicle about 4 cm. high by 7 cm. in width, the main branches repeatedly rebranched from above the middle, all glabrate, red and subtended by diverse bracteoles; pedicels erect, 3 mm. long; calyx elliptic, more contracted toward the base, 3.5 mm. long, terminated by 4 apiculate teeth, glabrous or minutely pulverulent, incarnatus especially the apical portion; corolla 1.5 cm. long including the 5 mm. long segments, glabrous, tube whitish; lobes 4, imbricately twisted in the bud state, ovately elliptic, roseus; stamens 4, alternating with the segments; glabrous filaments short but curved, inserted near the throat; anther 2.5 mm. long, basifixed, lobed toward the base, pointed at apex, narrowly oblong; style slender, glabrous, the clavate stigma lobed; ovary apex annular.

Type specimen number 13767, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

In well drained soil of humid forests at 3000 feet altitude along the Dalahion river side. "Bagobodon" is its vernacular Manobo name.

Its membranous leaves with more prominent nerves and reticulations distinguish it as a variety.

Ixora gigantifolia Elm. n. sp.

A slender erect shrub-like tree; stem 1 dm. thick, terete, crooked, 5 to 7 m. high, few branched toward the top only; wood white, odorless and tasteless, moderately hard or soft; bark smooth and grayish white on the outer surface, testaceus otherwise; main branches few, relatively short, sparingly rebranched, the glabrous ultimate ones somewhat compressed. Leaves chiefly horizontal, subchartaceous or subcoriaceous, almost flat, much lighter green beneath, curing deep brown on both sides, entire, the margins a trifle curved upon the nether side, glabrous, elliptic, opposite, not numerous and widely scattering, 2 to 3 dm. long, 1 dm. wide, oblong in shape, rounded at both ends or the smaller blades broadly obtuse at apex; midrib raised beneath, grooved above, deep reddish brown when dry; lateral nerves averaging 10 on each side, ascending, nearly straight, tips branched or coarsely anastomosing, prominent on the lower side only, reticulations coarse and nearly equally seen from both sides; petiole 1.5 cm. long and nearly one third as thick, turning blackish brown upon drying, shallowly though widely grooved along the upper side; stipule deciduous, 1 cm. long and nearly 7.5 mm. wide below the middle, apex blunt. Infrutescence erect, 1 dm. long, terminal; peduncle yellowish green, glabrous, 5 cm. long, occasionally branched from the base which is usually provided with a series of imbricating stipular bracts, dark brown when dry; branches divaricate, forming a corymbose panicle 1 dm. across; branchlets above the middle, numerous, puberulent, freely rebranched; pedicels short or none, apparently ebracteate; calyx subcylindric, nearly glabrous, roundly 5-lobulate. Fruits compressed globose, less than 1 cm. across in the fresh state, 7.5 mm. thick when dry, smooth, when young pale or yellowish green, turning bright red and finally deep vinosus, bearing the much constricted and short calyx tube; pyrene 2, centrally attached, plane on the inner side, plump on the outer, edges rounded, circular from face view, 6 mm. across.

Type specimen number 14206, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in dry or well drained soil along the forested ridge in the saddle between Duros and Cawilanan peaks at 3500 feet altitude.

It is neither of *Merrill's* thick and large leafed *I. crassifolia* nor *I. pachyphylla*.

Ixora magnifica Elm. n. sp.

Suberect undershrub; stem terete, crooked, 2.5 cm. thick, 3 to 4 m. high, very sparingly branched toward the top only; wood whitish, rather tough, odorless and tasteless; bark blackish brown and nearly smooth, testaceus except the epidermis; branches slender, likewise sparingly rebranched, strongly recurved or drooping, glabrous even the green terminal portion, terete. Leaves horizontally spreading, thinly chartaceous, glabrous, paler green beneath, curing greenish brown on both sides, broadly oblong or the smaller ones elliptically oblong, apex obtusely rounded or occasionally short acute, base broadly obtuse, the entire margins obscurely wavy or rugose and in the dry state a trifle involute, the larger ones 2 5 dm. long by 7 cm. wide across the middle, oppositely scattered, flat and only gradually recurved; midrib very prominent beneath, nearly plane above, yellowish brown on the herbarium specimens; the nerves 9 to 11 on each side, subdivaricate except the much ascending basal ones, slightly curved except the distal ends which form a united line 5 to 8 mm. below the edge, occasionally secondary ones intervening, reticulations coarse and quite evident beneath only; petiole 1 to 1.5 cm. long, glabrous, caniculate; stipule interaxillary, 5 mm. long, nearly as broad across the base, subpersistent, terminated into a setaceous point, glabrous brown and subchartaceous especially the basal portion. Inflorescence erect, upon a very short green stalk, flattish or corymbosely paniculate, often 2 dm. across, subtended by a pair of regularly sized leaves; main branches subcompressed, articulate at the base which is subtended by stipular subpersistent bracts, rebranched from near the base; ultimate branchlets quite comparatively numerous, subtended by sharply pointed bracteoles, all the branches ruber red; flower odorless, of short duration, in the bud state aurantiacus, those in full anthesis deep miniatus; pedicel 1 to 3 mm. long, slightly red, glabrous, terminated by a pair of acute teeth 1 mm. long; calyx also glabrous, greenish especially the broadly obtuse 4 segments, 3 mm. long, the basal portion stalk-like; teeth persistent, erect, 1 mm. long, with elongated gland appendages upon the inner basal portion; ovary rim thick and fleshy; corolla tube very slender, 5 mm. long, glabrous, yellowish red, terminated by 4 segments; bud ovoidly elongated, 7.5 mm. long, the lobes imbricately twisted; lobes rotately spreading in anthesis, elliptic, 1 cm. long, one half as wide across the middle, finely veiny, aurantiacus but finally deep miniatus; stamens 4, alternating with the lobes and inserted upon the throat; filaments short, compressed, persistent and recurved, glabrous; anthers 4 mm. long, linearly oblong, attached slightly below the middle on the back, abruptly constricted into a point at the apex, base slightly compressed; style very slender and glabrous, equalling the corolla; stigmas composed of 4 fleshy recurved lobes.

Type specimen number 13424, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

This magnificent *Ixora* is only here and there met in moist fertile ground covered with humus in dense woods or forests at an altitudinal range from 500 to 1500 feet. This very showy and conspicuously flowered shrub is called by the Monobos "Bonog-bonog" and is frequently brought in and tucked in below the roof of their houses as ornaments.

Primarily distinguished from *I. mearnsii Merr.* by its much longer corolla and obtusely rounded leaf tips. Also closely related to *I. lobbii Loud.*

Ixora macrophylla Bartl.

Field-note:—Slender erect or shrub-like tree; stem crooked, subterete, 6 inches thick, at least 15 feet high, branched toward the top but occasionally from near the middle; wood hard, heavy, brittle, quite without odor or taste, finely grained, yellowish tinged; bark smooth, yellowish gray, otherwise testaceus; branches divaricately spreading, rebranched, the slender twigs quite rigid; leaves horizontal, chartaceous, paler green beneath; flat inflorescence pendant from the stem, the branches and even from the terminal leaf axils; stalks green or when old and exposed reddish or even deep red, calyx similarly changing in color; corolla and stamens white, stigma greenish, flowers odorless; fruits globosely compressed, 0.5 inch across.

Represented by number 13982, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in compact soil covered with dead foliage of the dense forests on a steep ridge at 1250 feet of Giwantawan. "Ligad" is its Manobo name.

Ixora oblongifolia Elm. n. sp.

Low but erect shrub; stem 1.5 cm. thick, 1 m. high or higher, few branched at the top only; wood quite hard and whitish, covered with smooth brown bark; branches horizontal or descending, occasionally rebranched; twigs green, glabrous and only subterete. Leaves heavy, leathery, pendant, flat, lucid and dark green above, yellowish green beneath, opposite, glabrous, entire, gradually acuminate at the slightly recurved apex, base broadly rounded, oblong, sublucid on the upper deeper green side, drying dull brown, the larger blades 3 dm. long by 8 cm. wide across the middle or below it, the smaller ones only one half as large; midrib raised beneath, flat along the upper surface; lateral nerves from 9 to 13 pairs, rather straight and oblique, their tips usually branched at the distal ends and coarsely interarching, the reticulations coarse and equally evident from both sides; petiole 1.5 to 3 cm. long, glabrous, subterete, thickened at or toward the base; stipule interaxillary, 1 cm. long or less, boat-like and encircling the stem, drying dark brown, also glabrous, setaceously pointed. Inflorescence terminal, pendant, 1 to 3 dm. long, branched and flower bearing at the ends only; peduncle slender, subterete, surrounded at the base by a stipular-like bract, reddish especially toward the end; branches opposite, the lower or longer ones occasionally rebranched, compressed, at most 3 cm. long, forming a corymbose raceme 3 cm. across or 2 cm.

wider in the fruiting state, all subtended by acute subpersistent bracts, glabrous or puberulent, dull brick red, articulated; pedicels whitish, 3 mm. long or shorter; calyx 3.5 mm. high, glabrous, 2 mm. wide across the truncately 4-toothed apex, red, cup shaped, with rounded base; lateral pedicels 3 mm. long, also glabrous, articulate and at the apex provided with a pair of 1.25 mm. long teeth; corolla tube brighter red, 1 cm. long, subglabrous; bud dull red, ellipsoid, the lobes imbricate and twisted; segments 6 mm. long, nearly 4 mm. wide, oblong to elliptic, with truncately rounded ends, dark red, rotately spreading in anthesis, in age reflexed and with sides curved upon the nether side; stamens 4, alternating with the segments and inserted upon the throat; filaments short, glabrous, compressed; anther 3.5 mm. long, truncately constricted at the base into 2 lobes and at the apex into a point, dorsifixed; style slender, glabrous, bearing 2 flattened fleshy stigmatic lobes. Fruits subglobose, 8 mm. in diameter, dark and shining red; its pyrenes 2, subcircular and attached near the middle of the ventral side.

Type specimen number 13775, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in humus covered good soil upon steep densely wooded slopes at 3000 feet altitude, on the Dalahion river side. "Bitajoyan" in Monobo.

Only distantly related to *I. inaequifolia C. B. Rob.* and to *I. macgregorii* of the same author.

Ixora salicifolia Blm.

Field-note:—Suberect undershrub; stem crooked, 2 yards high, the size of a man's finger, few branched toward the top, the greenish wood covered with smooth latericius bark; branches few, short, crooked, horizontal or descending; leaves coriaceous, scattered along the twigs, subpendant, very dark green and creased along the midrib above, much paler green beneath, the midrib whitish; terminal inflorescence odorless, all the stalks ruber red, the segments varying from miniatus to ruber, even the bud state miniatus, tube incarnatus.

Represented by number 13527, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Here and there in densely forested regions at 3000 feet of Giwantanan, in dry and deep foliage covered stony soil.

LASIANTHUS Jack

Lasianthus clementis Merr.

Field-note:—Erect undershrub; stem one or more from the same root, 0.75 inch thick, terete, 6 feet high, branched from below the middle; wood soft, greenish, with a brown pith, quite odorless and tasteless; bark smooth, dull green; branches spreading or ascending, unbranched or very sparingly branched, leaves chartaceous, ascending, flat, tips recurved, much paler green beneath; corolla pure white; young fruits green, the mature ones nearly one half inch thick and irregularly globose, pendant, soft, with few to several stone seeds, cyaneus except the white meat.

Represented by number 13613, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In more or less stony soil of a steep wooded slope between Duros and Cawilanan peaks at 3500 feet altitude. "Igbot" is the Manobo name.

Lasianthus everettii Merr.

Represented by number 14554, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in well shaded rather fertile soil of small depressions between Duros and Cawilanan peaks at an altitude of 3500 feet.

Lasianthus copelandi Elm.

Field-note:—Erect undershrub; stem 0.5 inch thick, terete, a yard or two high, mostly branched at the top; wood soft, greenish or yellowish green, with a large pith, odorless and tasteless, covered with smooth yellowish brown bark; branches divaricate, seldom rebranched, green, the terminal ones shorter; leaves submembranous, horizontal or descending, flat with recurved tips, lighter green beneath; flowers solitary or in axillary pairs, ascending, stramineus; corolla caducous and soft in texture; calyx yellowish green, bracts dark green; fruits sessile, also ascending, ovoidly ellipsoid, fully 0.5 inch long, bearing the calyx segments, dark cyaneus in color, soft, its meat white, with 4 stone seeds, somewhat juicy.

Represented by number 14041, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in well drained and deeply humus covered soil upon steep forested ravines at 3500 feet altitude, between Duros and Cawilanan peaks. "Abohon" in Manobo.

Lasianthus microphyllus Elm. n. sp.

A lax and reclining shrub; stems several from the same root cluster or branched from near the base, green, terete, 8 mm. thick, 1 m. long, numerously rebranched, crooked; twigs flexible, quite numerous toward the end of the main branches or stems, spreading, the green apical portion subglabrous. Leaves opposite, well scattered along the branchlets, copious, submembranous, horizontal, glabrous except the nerves beneath, obtusely rounded at the base, the recurved apex slenderly and sharply acuminate or caudate and usually subfalcate, drying nearly equally brown on both sides, entire, ovate to elliptic oblong, the lamina 5 cm. long, 0.75 cm. wide at the middle though frequently smaller; midrib quite prominent beneath and minutely puberulent; lateral nerves 4 pairs, much ascendingly curved, very similar in vestiture, tips obscurely united just beneath the edge, cross reticulations faint yet equally visible from both sides; petiole less than 5 mm. long, appressed puberulent, finally glabrous, slender; bud bracts in pairs, divaricately recurved, slenderly acuminate, less than 5 mm. in length, olivaceus short pubescent, deciduous. Flowers erect, solitary or in small axillary clusters; calyx glabrous, 2 mm. long, narrowed toward the base, divided to the middle into 5 rather narrow and sharply pointed teeth whose outer tips are sparsely ciliate; corolla deciduous, 6 to 7 mm. long, narrowest across the middle, tube rather inflated especially at the base, glabrous except the hairy throat and upper side of the petals; lobes 5, lanceolately oblong, only one half as long as the tube; stamens 6, inserted near the throat and alternating with the segments; free portion of filament short, flattened, ciliate; anther 1 mm. long, basifixed, equally rounded or emarginate at both ends, pale yellow. Berry obovoidly globose, 8 mm. across when fresh, 3 mm. smaller in the dry state, glabrous, cyaneus when mature, bearing the persistent calyx segments, meat juicy and white; the 5 deep brown colored stone seeds 3 mm. long, smooth, more pointed toward the base, apex rounded, somewhat unequal in size.

Type specimen number 13790, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected on the summit of mount Urdaneta (Masay in Manobo) in wet cold mossy wind swept woods at 6500 feet altitude. The natives or Manobos call it "Malabod."

By its fruits related to *L. tashiroi Mats.*

Lasianthus obliquinervius Merr.

Field-note:—Low and erect undershrub; stem 0.5 inch thick, terete, quite rigid, 1 to 3 feet high, branched toward the top only; wood dingy white, without odor or taste, soft, the relatively large pith similarly colored; bark smooth, yellowish brown, the middle portion green, the inner side wood colored; branches divaricate, green, unbranched, the upper ones shorter; leaves chartaceous, horizontal or descending, flat but tips strongly recurved, smooth and lucid above, lighter beneath; young fruit green, when mature black, ellipsoidly elongated and at least 0.5 inch long.

Represented by number 14007, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Found in rich black soil of a densely jungled wood depression at 3000 feet altitude of Giwantanan. "Nalimatou" is the Manobo name.

Lasianthus submembranifolius Elm. n. sp.

Laxly branched shrub; branchlets terete, glabrous even the young portion, slender though not numerous. Leaves opposite, well scattering along the branchlets, membranous or submembranous, horizontal or descending, greenish in the dry state, oblong, the apex rather abrupt and sharply acuminate, base obtuse or the obtusely rounded margins entire, glabrous and sublucid on the upper slightly darker green side, the larger ones 15 cm. long by one third as wide across the middle or below it, frequently a trifle inequilateral below the middle; petiole less than 1 cm. in length, glabrous, shallowly caniculate above, the base expanded or more or less united with the interaxillary stipules which are quite short and broadly rounded; midrib prominent beneath especially toward the base, narrowly grooved above, yellowish brown in the dry state; lateral nerves 4 or 5 on each side, very oblique or ascending, tips occasionally forked or coarsely anastomosing but usually united, reticulations minute, all dirty brown pulverulent beneath. Flower in small glomerules from the leaf axils or from the axils of their scars; pedicels 1 to 2 mm. long, glabrous, subtended by a pair of stout apiculate bracts; calyx also glabrous, 2 mm. long, 5-lobed nearly to the base, the lobes oblongish and submembranous; corolla cremeus, caniculate, 3.5 mm. long, 5-lobed, glabrous except the very finely ciliate throat region, tube inflated; segments 1.5 mm. long, hyaline as is also the tube, normally 5 but frequently 6, spreading or reflexed, bluntly oblong; stamens as many as segments and alternating with them; anther 0.75 mm. long, subbasifixed, slightly lobed at base, truncately apiculate at apex; filament short, glabrous, inserted upon the throat; ovary densely and finely white hairy; style 1.5 mm. long, divided and sparsely ciliate at base; stigma much thickened, slightly compressed, ultimately separating, hairless; mature drupe 7.5 mm. long, subglobose or broadly ellipsoid; stone seeds 5, smooth, at least 5 mm. long, dark brown, sharply pointed at each end, the inner sides smooth and plane, the convex side coarsely rugose.

Type specimen number 14261, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in a depression or saddle between Duros and Cawilanan peaks at 3250 feet altitude.

LUCINAEA DC.

Lucinaea epiphytica Elm. n. sp.

Epiphytic shrub; stem repeatedly branched and forming tangled or subscandent masses; branchlets grayish brown, ringed by the old leaf scars, flexible though very wiry, the glabrous ascendingly curved tips obscurely angular. Leaves opposite, chiefly toward the distal ends of the branchlets, thick and rigid, the entire margins subinvolute in the dry state, darker green above, drying very unequally brown on the two sides, mostly acute, rounded or broadly obtuse at base, elliptic or nearly so, the larger ones 7 cm. long by 3 cm. wide, glabrous even in the young state; midrib impressed along the upper side; lateral nerves 7 to 9 pairs, relatively obscure, oblique, nearly straight, their tips only faintly united, reticulations obsolete; petiole 1 to 2 cm. long, subterete, narrowly grooved above, glabrous. Infrutescence erect, terminal; peduncle 1, 2 or 3-clustered, 2 to 3 cm. long, angular or subterete, shining pale green, nearly black when dry, each subtended at the base by a series of short blunt loosely imbricated blackish brown and nearly glabrous deciduous bracts; fruiting heads subglobose, 2 cm. in diameter, bearing about 9 young sessile fruits which are crowded upon the circular much flattened more or less fleshy torus; fruits whitish, glabrous, ellipsoidly oblong, 1 cm. long, 6 mm. thick, with a deep cupshaped apex; ovary composed of 5 irregular masses, bearing a much thickened stigmatic crust; seeds numerous, imbedded, reddish brown in the dry state, compressed, subcordate or lenticular in shape, 1 mm. across, smooth.

Type specimen number 14147, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Upon the main limbs of large trees on the wind swept forested summit of Cawilanan peak at 5000 feet elevation. "Salimpatungao" is its vernacular Manobo name.

Primarily differs from *L. monocephala Merr.* in having usually more than one head upon shorter stalks; leaves in ours not reddish tinged in the dry state, generally widest below or at the middle. not above it, their laminae thicker in texture and broader for their length. It is also quite close to *L. involucrata Elm.*

MUSSAENDA Linn.

Mussaenda attenuifolia Elm. n. sp.

Shrub 5 m. high; main branches arising from below the middle of the 12 cm. thick stem which is crooked though subterete; wood rather soft, whitish, light in specific gravity, odorless and tasteless; bark grayish white mottled, smootish, brown except the epidermis; twigs slender and lax, dark brown, whitish lenticelled, the young suberect portion densely soft ferrugineus. Leaves opposite, scattering along the branchlets, ascending, submembranous, much paler green beneath, conduplicate, the rather abrupt sharply pointed acuminate apex recurved, usually attenuate at the base but occasionally broadly obtuse, entire, subglabrous or only sparsely puberulent upon the brown upper side, the lower soft pubescent side greenish when dry, very unequal in size, the larger leaves 2 dm. long, 7 cm. wide above the middle, obovately oblong, the smaller leaves broadly oblanceolate and only 7 cm. long; midrib densely yellowish gray strigose on its prominent lower side, puberulent in the groove on the upper side of the blade; lateral nerves 10 to 14 on each side, ascendingly curved except the basal ones which are very oblique and nearly straight, tips minutely united, reticulations quite obscure; petiole about 1 cm. long, subferrugineus tomentose; stipule quite variable in size, brown, membranous, deciduous, strigose hairy on the outside, 5 to 8 mm. long, gradually tapering from the expanded base to the setiform apex, occasionally split. Inflorescence terminal, erect or suberect, usually less than 1 dm. long and nearly as wide; peduncle about one third that length, subtended by a pair of leaves and foliaceous bracts; lower branches ascendingly curved, opposite, subtended by slender or linear hairy bracts which at the base are generally provided by a pair of bracteoles, rebranched above the middle; branchlets quite similar except much shorter, subtended by setaceous bracts and toward the apex bearing few scattering flowers, all the stalks and bracts subferrugineus; terminal flowers subsessile, the lateral ones short pedicelled, erect or nearly so; pedicels subtended by bracts, pubescent on the outer side only, 2 to 3 mm. long, densely pubescent; calyx greenish, nearly 1 cm. long, mostly tubular, similarly pubescent, terminated by 5 sharply acute teeth 3 mm. long and pubescent on the outside only; occasionally the outer calyx segment developes into an 8 to 13 cm. long white or creamy white bract; lamina membranous, horizontally spreading, 5, parallel nerved, abruptly attenuate at base, its stalk soft pubescent and 2 to 3 cm. long, apex abruptly pointed, ovate to elliptic in shape; corolla 4 cm. long, tubular except the spreading lobes, greenish to yellowish white, pubescent on the outside; segments 5, oblongish, with rather constricted apices, citrinus but soon turning aurantiacus, finely papillose on the upper side; stamens 5, inserted upon the corolla tube a trifle above the middle; free filament 1 mm. long, compressed, glabrous; anther linear, attached below the middle, the basal portion constricted and apparently sterile, apex blunt, 5 mm. long, 0.5 mm. across, introrse, laterally dehiscent; pistil equalling the throat, the style slender and glabrous; stigmas of 2 flattened fleshy lobes 7.5 mm. long; fruits ellipsoidly elongated, 2 cm. long, 1 cm. thick across the middle, bluntly pointed, ascending, the white bracts occasionally persistent on the fruits, 2-celled or of 2 dry carpels, smooth, without lenticels, pubescent when young, ultimately nearly glabrous; placentae membranous, vertical; seeds very numerous, blackish brown, compressed, pitted, sublenticular, 0.75 mm. across.

Type specimen number 13304, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Fairly well scattered in wet earth and upon rocky ledges of the wooded banks of the Catangan creek from 750 to 1500 feet altitude. Its vernacular Manobo name is "Bungog."

Mussaenda philippica Rich.

Field-note:—Lax shrub; stem subterete, 1 to 2 inches thick, 15 feet high or less, branched from below the middle; main branches ascending, brown and grayish lenticelled, old bark yellowish brown; twigs lax and slender; leaves descending, flat, membranous, much deeper green beneath; inflorescence terminal, suberect, the stalks and calyx green, corolla yellowish green on the outside, aurantiacus on the upper side of the lobes; bracts white, descending, showy.

Represented by number 13301 *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Upon moist rocky banks of the Catangan creek at 750 feet altitude. "Talawantawa" is the Manobo name.

MYRMECODIA JACK

Myrmecodia urdanetensis Elm. n. sp.

Epiphytic and insectivorous; bulb solitary or few clustered, the clusters usually a trifle grown together at the base, varying from 5 cm. to 1.5 dm. long and proportionate in thickness, ellipsoid or usually the older ones thicker below the middle, cucumber shaped, the surface nearly ardesiacus, with shallow more or less longitudinally curved ridges which are provided with soft spines, herbaceous, honey combed, canal brown, otherwise the meat is white or greenish white; neck short, solid, 1 to 3 cm. long, 1 to 2 cm. thick, erect, composed of 4 vertical scars densely surrounded by similar spines, alternating with 4 grooves of flower producing sections. Leaves folded, arranged in rows, chiefly terminal, erect, glabrous, curing, brown on both side, thickly coriaceous, soon falling and leaving rows of conspicuously plated scars, flat or only the acute apex recurved, attenuate toward the base, dull green on both sides, blades 5 to 7 cm. long, 1.5 cm. wide at the middle, narrowly oblong or broadly oblanceolate; midrib shining maroon or badius brown and quite prominent beneath; the 4 to 6 lateral nerves subdivaricate and only slightly curved, tips barely united, reticulations obsolete; petiole 2 to nearly 5 cm. long, distinctly caniculate along the upper side especially toward the somewhat enlarged base, glabrous, the lower side similar in luster and color to the midrib, arranged or scattered in the smooth vertical sections, more or less protected by the adjoining scar bristles. Flowers white, short; fruits whitish, salmon yellow ultimately, juicy, ellipsoid, faintly streaked longitudinally, about 7.5 mm. long, bearing the constricted and truncate calyx rim; pyrenes about 3, obscurely triquetrous, 3.5 mm. long, nearly 2 mm. thick across the base, and roundly truncate, more tapering toward the blunt apex, grayish and somewhat black punctate.

Type specimen number 14083, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Wafted from the tree tops of the humid windy forested region around the upper side of the lake Donao at 5250 feet altitude.

Not *M. apoensis Elm.* because of its much smaller leaves with slenderer petioles.

NAUCLEA Forst.

Nauclea ategii Elm. n. sp.

A middle sized tree; stem 3 dm. thick, 7 to 10 m. high, branched from the middle or below it; twigs rather slender, drooping; the ultimate ones ascendingly curved, angular, short yet densely reddish brown puberulent, ultimately smooth and glabrous, lax. Leaves opposite, descending, subcoriaceous, nearly flat, curing unequally greenish brown on both sides, very unequal in size, narrowly oblong or elongated, gradually tapering to the acuminate apex, base truncate and broadly auriculate or cordate, the apical pair usually inequilateral at the base, from 1 to 4 dm. long and 3 to 9 cm. across the middle, the entire margins occasionally undulate, glabrous on the upper side when old, rather soft puberulent or short grayish pubescent, pleasing green above, much lighter green beneath; midrib very bold beneath and reddish brown when dry though yellowish in the fresh state, grooved and nearly glabrous along the upper side; lateral nerves 13 to 15 pairs, relatively conspicuous and similar in vestiture beneath, oblique, tips strongly curved upwardly, reticulations very minute yet quite visible from both sides; petiole 5 to 10 mm. long, grayish short pubescent beneath, caniculate above, rather stout; bud bract 1.5 cm. long, 6 mm. wide, oblong, cinereous on the basal exterior, brown when dry. Fruits upon erect or ascending stalks; peduncle solitary or 3-clustered, 4 to 6 cm. long, stout, angular, brown, puberulent, thickened and articulate at the distal end; head globose or rugosely so, nearly 2 cm. in diameter, smaller in the green bud state, subtended by brown nearly glabrous very caducous bracts; flowering bracts 4 to 5 mm. long, flattened, sparsely pubescent along the edges and upon exposed surface, terminated by a velvety brown cone; corolla 1 cm. long, tubular, cremeus, 1 mm. thick at the base, twice as thick toward throat; the 5 lobes oblong, 1.5 mm. long, 1 mm. wide, the middle outer region finely pubescent as well as the upper portion of the tube; stamens 5, included; glabrous filaments attached 2 mm. below the throat, 1 mm. long; anther pale yellow, 1.25 mm. long, oblong, basifixed, irregularly truncate at apex; style 1.5 to 2 cm. long, filiform, glabrous, terminated by a subglobose stigma; capsules or cocci 2-celled, 7.5 mm. long, angular, not concrete, gradually tapering from base to apex, bearing a much thickened deciduous more or less yellowish pulverulent truncate cap, dehiscing laterally; placenta wiry, slender, somewhat thickened at the apex, persistent; seeds light brown, lenticular, provided at each end with slightly unequal flattened silvery white appendages; receptacle less than 1 cm. long, densely provided with ciliate bracteoles.

Type specimen number 13910, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in wet sand gravelly soil among larger bowlders along the wooded banks of the Dalahion river at about 1000 feet altitude. Also observed upon precipitous high bluffs along the Minusuang river at 500 feet lower elevation. Called "Mahambolod" by the Manobos. Named with pleasure after *Sr. Andres Atega,* a planter and commercial man of Cabadbaran, through whose kind aid I was enabled to explore this region.

Its affinity is with *N. Kentii Merr.* and *N. mindanaensis* of the same author.

Nauclea media Hav.

Field-note: —Very slender trees; stem 8 inches thick, 35 feet high, straight, terete, branched from the middle; wood sappy white, moderately soft, odorless and tasteless; bark latericius except the smooth whitish surface; branches ascending, sparingly rebranched, the green twigs suberect; leaves horizontal or ascending, thinly coriaceous, darker green above, the prominent nerves beneath often turning red; flowering head 2 to 3 inches across, globose, slightly foetid, deciduous, whitish except the greenish calyx segments and the more yellowish receptacle; fruits concrete, the individual scars green with brown borders, 1.5 inch across, irregularly globose.

Represented by number 13454, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In gravelly soil along the wooded banks of the Catangan creek from 500 to 1500 feet altitude. "Palanglitan" is the Manobo name.

Nauclea philippinensis (Vid.) Hav.

Field-note:—Small but erect tree; stem terete, 3 to 4 inches thick, 15 feet high or higher, branched from the middle; wood quite hard and heavy, sappy white except the brownish heartwood, without odor or taste; bark smooth and mottled on the surface, brown otherwise; main branches divaricately spreading, rebranched; leaves coriaceous, horizontal or descending, recurved especially toward the apex, much lighter green beneath; heads solitary or in pairs or in 3's, upon erect green stalks, dark green except the dirty brown floral remnants.

Represented by number 14056, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

In red compact soil of a humid wooded ridge at 3500 feet altitude, between Duros and Cawilanan peaks. "Obodobod" is the Manobo name.

OPHIORRHIZA Linn.

Ophiorrhiza caespitosa fulva Elm. n. var.

Loosely caespitose, biennial herbs; stems averaging 1 dm. high, occasionally the older ones nearly twice as long and creeping toward the base, crooked, frequently with few stems arising from the same base, seldom branched, the upper part soft fulvus hirsute, the basal portion dirty and much less pubescent; roots fine, fibrous, scattered along the lower sides of the creeping ground portion. Leaves opposite though of very unequal pairs, chiefly horizontally spreading, soft membranous, ovately lanceolate for the smaller and ovately oblong for the larger ones, much lighter green upon the nether side even in the dry state, only sparsely pubescent on both sides except along the light fulvus nerves beneath, usually clustered along the distal end of the stem or branches, the larger lamina 4 cm. long by at least 1.5 cm. wide below the middle, the acute to acuminate rather bluntly pointed apex recurved, entire, the base obtuse or broadly rounded, generally a trifle inequilateral; midrib conspicuous beneath by its hairs, scarcely caniculate above, with 5 to 7 much ascendingly curved lateral nerves, reticulations none; petiole 1 to 8 mm. long according to the size of leaves, densely fulvus hirsute. Inflorescence erect or suberect, terminal or from the uppermost leaf axil, upon short similarly fulvus stalks which at the base is subtended by foliaceous bracts; flowers in small umbellate clusters, subsessile or upon short hairy stalks, subtended by greenish bracts; bracts laciniate, 3 to 5 mm. long, ciliate pubescent; calyx oblong, 2.5 mm. long, bristly pubescent, terminated into 5 green linear 1 mm. long teeth; bud corolla 3.5 mm. long, yellowish white, obovoidly tubular, with sparse ciliate hairs on the exterior, eventually separating into 5 lobes; stamens of the same number; filaments glabrous, inserted upon the basal portion of the anthers, truncately oblong, 1 mm. long, basifixed; style 2 mm. long, the lower portion glabrous, the upper one half lanceolate and finely ciliate toward the apex; ovary crown glabrous, with 2 fleshy lobes; capsule 6 mm. wide, one half as high, tapering from base to lateral wings, sparsely brown hirsute, dehiscing along the upper margins; placentae of each wing columnar; seeds numerous, light brown, angular or cube-like, nearly 0.5 mm. across.

Type specimen number 14306, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in oose deeply humus covered soil in the saddle between Duros and Cawilanan peaks at 3500 feet altitude.

Mainly separated as a variety by its distinctly deep fulvus pubescence, although there are other minor differences. It was mixed with number 14208 or *O. curtiflora Elm.* and every plant could easily be picked out of the mixture without a mistake.

Ophiorrhiza camiguinense Elm. n. sp.

Low suberect shrub or reclining and subherbaceous; stem 1.25 cm. thick, terete, green, branched from the middle though more numerously so toward the top, glabrous, brown when dry, crooked, toward the base taking roots at the joints, the ultimate branches also crooked and suberect. Leaves subsessile, opposite, more numerously crowded toward the distal ends, thinly coriaceous or submembranaceous, chiefly horizontal, light sulphureus beneath in the fresh state but turning pale red upon drying, blackish brown upon the upper side when dry and deep velvety green in the fresh leaves, lanceolate though widest across the middle or narrowly oblong, gradually extended into the long acuminate to caudate apex, base slenderly cuneate or subattenuate, entire, very unequal in size, the smaller usually subfalcate, the average ones 1 cm. long by 3 cm. wide across the middle, the blades of the pairs frequently much unequal in size; midvein flattened and darker reddish brown in the dry state beneath, minutely grooved above; lateral nerves about 6 pairs though with secondary ones intervening, ascendingly curved and similarly colored beneath, tips only faintly united, reticulations none; stipule nearly obsolete. Infrutescence seldom exceeding 3 cm. in length, erect, terminal or occasionally from the uppermost leaf axils, glabrous, branched from the middle or above it; peduncle solitary or with a pair of lateral ones from the same place, generally subtended at the base by a pair of small slender leaf-like bracts, compressed, striate, glabrate or pulverulent; branchlets ascending, quite short and occasionally rebranched, otherwise similar to the peduncle; petiole suberect, 2 to 5 mm. long, pulverulent or puberulent, becoming nearly glabrous; calyx glabrous, reddish, 2.5 mm long, sharply 5-toothed; corolla also glabrous and similarly tinged in the dry state, adnate, at least 2 mm. long, the broadly linear 4 lobes separating nearly to the base; filaments short, inserted near the base of the corolla; anther 1.5 mm. long, linear, basifixed, emarginate at apex; style 2 mm. long, glabrous, barely cleft at the stigmatic end; ovary with 4 broad cushion-like appendages; capsule coriaceous, turning red while curing, glabrous, compressed, obreniformly winged, 1 cm. broad, only a few mm. deep, 2-celled, dehiscing across the whole length of the top; seeds very numerous in each cell, brown, squarrosely angular, 0.25 to 0.33 mm. across.

Type specimen number 14223, *A. D. E. Elmer*, Mambajao (Camiguin Island), Province of Misamis, Mindanao, November, 1912.

In loose well disintegrated shale rock and in deeply shaded places at about 3000 feet above the sea.

Differs from *O. mungos Linn.*, its nearest ally, by its lanceolate and very short petiole or subsessile leaves; and by its fewer, more scattering and pedicellate capsules.

Ophiorrhiza curtiflora Elm. n. sp.

Low and somewhat succulent herbs; stems terete, averaging 2 dm. long, 3 to 5 mm. thick, creeping or reclining and branched, forming more or less dense masses, the ultimate portion fuligineus pubescent or scurfy and suberect; roots fibrous, yellowish and scattered along the lower side but especially at the point of branching; twigs few to several, relatively short, suberect toward the top only, fulvus tomentose. Leaves opposite, unequal, membranous, ascending or horizontal, flat, velvety deep green beneath and veiny, depressed on the upper side, glaucous white or green beneath even in the dry state, dark greenish on the upper densely roughened and minutely hispid though glabrous side, entire margins very finely ciliate, the smaller lamina broadly lanceolate and 1 cm. long, the longer ovately oblong ones 6 cm. long by 2 cm. wide below the middle, chiefly toward the top of the gradually acute or occasionally acuminate apex, rounded or frequently broadly obtuse at base; petiole slender, varying 5 to 20 mm. in length, fulvus hairy; midrib similarly pubescent on both sides especially so beneath; lateral nerves 6 to 9 pairs, ascendingly curved but much more so toward their ends, often alternating with secondary ones; stipule thin, brown, caducous, 5 mm. long or longer, expanded at the base, otherwise subsetaceous, sparsely brown hairy. Inflorescence erect, terminal, subtended by few to several foliaceous bracts, very short; peduncle about 5 mm. long, only occasionally very short rebranched toward the top, terminated by few but sometimes by several flowers; flowers erect, subtended by setose green ciliately margined bracts; pedicel 1 or 2 mm. long, crisply pubescent or woolly; calyx 2.5 mm. long, oblong, finely pubescent, divided to the middle into 5 narrowly acuminate teeth; corolla 4 mm. long, tubular, glabrous except the pectinately pubescent median dorsal portion of the segments and the silky hairy region a trifle below the throat; lobes 1.5 mm. long, triangularly oblong, 5; stamens 5; glabrous filaments 2 mm. long, inserted upon the basal portion of the corolla; anther 1 mm. long, oblong, flattened, bluntly rounded or emarginate at both ends, subbasifixed; pistils glabrous, ovary rim fleshy, style 1 mm. long, the stigma nearly as long and with 2 compressed lobes; capsule flattened, 5 mm. wide, 4 mm. high, appearing flat or roundly 3-lobed but when old 2-winged from the side view, midvein conpicuously marked and terminated into apiculate teeth, broadly dehiscent along the upper side; placentae fusiform, with numerous ovules; seeds 0.5 mm. thick, deep brown, coarsely ridged and slightly angular, otherwise globose.

Type specimen number 14208, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in wet loam deeply covered with humus in a shallow ravine bottom of dense forests at 3500 feet altitude, between the peaks of Duros and Cawilanan.

Not *O. oblongifolia DC.* nor its more distant relative *O. caespitulosa Elm.*

Ophiorrhiza pubescens Elm.

Field-note:—Low and soft herbs; stem few inches long, solitary or few from the same fibrous roots, terete, soft in texture, atropurpureus; leaves flat and horizontal, soft membranous, much lighter or sulphureously light green; infrutescence erect, green, also soft in texture.

Represented by number 14033, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

In wet soil usually about rocks partly covered with humus of a densely wooded ravine along the Catangan creek at 3500 feet altitude. This quite characteristic species is only rarely found and then only in small quantity. "Paladnamamoc" is the Manobo name.

PAEDERIA Linn.

Paederia verticillata Elm.

Field-note:—Scandent and sprawling; stem terete, crooked, 2 inches thick, frequently rebranched toward the top; wood soft, acrid, arranged in few large concentric zones; bark smoothish, yellowish, thin; green twigs very slender and tough; leaves in verticels of 3 or 4, coriaceous, ascending from the petioles, recurved, deeper green on the upper flat surface, apex recurved; inflorescence a foot to a yard long, recurved from the ends of the larger branches; calyx red, buds very dark velvety red, corolla atropurpureus on the outside, the inner side whitish and hairy; anthers yellow.

Represented by number 13343, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Climbing upon and covering shruberries and jungled woods along the Catangan creek at 1250 feet altitude and in rather wet gravelly soil. "Libog" is the Manobo name.

Paederia verticillata tomentella Elm. n. var.

Twining and scandent; stem 1.5 cm. thick, flexible, fluted longitudinally, chiefly branched at the top; wood odorless, tasteless, very soft, with a white pith, greenish; bark smooth, greenish brown, with a green hypodermis; twigs long, twistingly twining, puberulent or glabrous with age. Leaves in whorls of 3, horizontally spreading, the shortly acute to acuminate sharply pointed apex recurved, otherwise flat, rounded at base, elliptic or oblongish, entire, the larger lamina 15 cm. long and one half as wide at the middle, submembranous, much paler green beneath, curing dull brown or nearly black on the upper side and grayish beneath, glabrous above, short and rather soft pubescent beneath, those leaves toward the ends of the branchlets much smaller; longer petioles 7 cm. long, glabrate, upper side when young puberulent; stipule linear, also puberulent, easily falling. Panicle pendant, green or yellowish green, terminal and elongated especially the free subdrooping ends, branched in whorls, the lower branches subtended by foliaceous bracts, the ultimate branchlets with flattened distal ends, divaricate and subtended by minute bracteoles, all olivaceus pubescent in the dry state; terminal flower sessile, the lateral ones subsessile; calyx 2.5 mm. long, 1.5 mm. wide across the truncate and 5-apiculate top, somewhat angular, tapering from the base, sessile, yellowish brown tomentose; ovary with a glabrous rim-like disk; fruit compressed, whitish, circular, 1 cm. in diameter, with 3 to 5 lateral veins on each side and with numerous radial lines; ovary 2-celled, central, cartilaginous; the 2 seeds circularly compressed, whitish, with a distinct stalk.

Type specimen number 13416, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

In dry and well drained soil of woods upon a small hillock at 500 feet above sea level. The vernacular or Manobo name is "Mabido."

Usually *P. verticillata Elm.* is less pubescent or nearly glabrous.

PAVETTA Linn.

Pavetta eucrantha Elm.

Field-note:—A slender erect shrub-like tree; stem few inches thick, 15 feet high, subterete, crooked, branched from the middle; wood moderately hard, whitish, without taste or odor; bark brown, smooth; branches divaricate, laxly rebranched, relatively short, twigs ascending; leaves horizontally spreading, nearly flat and only slightly recurved, thinly coriaceous, paler green beneath; infrutescence erect, the stalks pale green; fruits flavus, ovoidly globose, smooth and shining, 0.3 to 0.5 inch long, with a rather prominent greenish point.

Represented by number 13988, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Growing in loose well drained soil of a densely wooded incline or ridge at 1500 feet altitude of Giwantanan. "Yawocan" is the Manobo name.

PETUNGA DC.

Petunga longifolia DC.

Field-note;—A small erect tree; stem terete but crooked, 10 inches thick, 20 feet high, branched from above the middle; wood moderately soft, subfumosus in color, tasteless and odorless; bark thick, deeply checked longitudinally, on the grayish white surface castaneous otherwise; main branches ascending, repeatedly branched; the branchlets numerous all along, slender, green, flexible, spreading and descending or drooping, unbranched; leaves descending, thinly coriaceous, conduplicate and tips twistingly recurved, margins conspicuously wavy, paler green beneath; inflorescent spikes axillary, erect and usually curved toward the apex, flexible, rachis green, the ascending flowers odorless and also green except the whitish corolla.

Represented by number 13928, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

In rich soil of open woods or secondary forests at 500 feet altitude, along the trail to Bayabas and among the hemp fields. The bracts in ours are longer than those on the specimen collected on Balabac island. "Anislag" is the native Manobo name.

PLECTRONIA Linn.

Plectronia cyanea Elm. n. sp.

Low though erect undershrub; stem terete, 2.5 cm. thick, 1 to 3 m. high, branched from below the middle; wood quite tough, yellowish white, bitterish and slightly odorous; bark grayish green, smooth, deep green beneath the epidermis; branches divaricate, the lower or longer ones few rebranched, green though grayish when dry, more numerous and much shorter toward the top of the stem, the young portion compressed at the joints and angular. Leaves opposite, coriaceous, well scattered, ascending or horizontal, gracefully recurved at the sharply acuminate apex, base cuneate or merely obtuse, oblong, widest across the middle, oblong, the blades 12 cm. long and one third as wide, entire, drying grayish green or brownish, glabrous; midrib quite conspicuous and dark brown beneath, plane above, lateral nerves 5 or 6 on each side, divaricate, occasionally branched toward their ends which are interarchingly united about 5 mm. below the edge, plain from both sides; petiole nearly black in the dry state, 5 mm. long, more or less prominently caniculate, glabrous even when young; stipule thick, also glabrous, very short and apiculate, persistent. Infrutescence in the lower leaf axils or from the axils of the leaf scars; peduncle usually solitary, very slender, green and smooth, compressed, 1 cm. long, very shortly branched and thickened, bearing at the distal end a few flowers or only one fruit; calyx greenish white, corolla white and subterete; ripe drupes upon short pedicels, divaricate or subpendant, ovoidly compressed, less then 1 cm. long, somewhat foetid, juicy and dark cyaneus, rugosely compressed in the dry state, impressed on each flattened side, generally one side is defective thereby giving it on unsymmetric appearance; stone seeds 2, smooth on the inner face, otherwise rugose.

Type specimen number 13854, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Discovered in moist though compact reddish soil upon a steep wooded slope of Cawilanan peak at 4500 feet altitude. This rare shrub the Manobos call "Tingaan."

By the fruits it belongs to *Plectronia* rather than to *Lasianthus*, although its general aspects are that of the latter genus.

Plectronia viridis Merr.

Field-note:—Shrub; stem subterete, 10 feet high, 4 inches thick, crooked, branched from near the ground; wood odorless and tasteless, sappy white, rather soft; bark smooth, green and brown mottled; branches spreading, the tips quite crookedly curved and with suberect tips; leaves coriaceous, horizontal, paler green beneath, margins usually coarsely wavy, diverse in size; inflorescence erect, odorless, the stalks greenish, the calyx nearly purple, the reflexed corolla segments melleus, anthers orange red, pistil the color of the corolla segment; ripe fruits yellow, finally vermillion red, flatly globose, 0.3 to 0.5 inch across, erect.

Represented by numbers 13395 and 14055, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Inhabiting damp humus covered soil on a densely wooded steep slope at 2750 feet altitude of Giwantanan. "Lobloban" is the Manobo name for 14055.

PSYCHOTRIA Linn.

Psychotria agusanensis Elm. n. sp.

Scandent upon small trees; stem flexible, terete but crooked, 2.25 cm. thick, looping, branched at the top; wood soft, porous, sappy white, odorless and quite tasteless; bark thick, blackish brown and smooth on the surface, otherwise nearly atropurpureus; branches rebranched, forming hanging interlaced masses; twigs tough, only the green apical portion obscurely angular and puberulent or fulvus pubescent at the tips. Leaves copious, opposite, well scattered, thinly coriaceous, shining deep green above and glabrous, horizontal and flat except the abrupt acuminate recurved apex, base rounded, the entire margin subinvolute in the dry state, drying blackish brown, glabrate beneath except the nerves, the normal blades 7 cm. long by 4.5 cm. wide at the middle, the basal ones of the twigs usually much reduced, ovately elliptic but with sharp apical points; midrib fulvus pubescent beneath only; lateral nerves 6 to 8 pairs, ascending, sparsely hairy, tips archingly united, cross bars few and very faint; petiole less than 1 cm. in length, similarly hairy especially in the young state, somewhat compressed; interaxillary stipule at least as long as the petioles, membranous and brown, caducous, boot-like, apex rounded. Infrutescence suberect, terminal, paniculately branched from above the middle, profuse, 1 to 3 dm. across; peduncles usually 3 from the same place, somewhat compressed and fluted along its sides, at the base usually subtended by stipular bracts; branches opposite, divaricate, likewise rebranched from above the middle, at the base subtended by very short and apiculate bracts and apparently articulated; ultimate branchlets strict, bearing few to several fruits toward the distal end; pedicels 2 to 4 mm. long, they as well as all the infrutescent stalks deep brown; drupes dark green, obovoid in the fresh state, grayish white and ellipsoid when dry, usually creased longitudinally on the two sides, otherwise smooth, 5 mm. long or less, 2 mm. thick at the middle, bearing at the apex the 4 minute calyx teeth; pyrenes, equally tapering and rounded at both ends, elliptic from the side view, edges also rounded, plano-convex, 3.5 mm. long, nearly 2 mm. wide.

Type specimen number 13667, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Climbing up to twenty feet above the moist stony ground of a wind swept forested ridge of Cawilanan peak at 4000 feet altitude. "Simbanag" in Manobo.

From *P. diffusa Merr.* it differs in having larger more numerously nerved leaves. From *P. ovalis Elm.* in having longer petioles, larger blades which are more sharply pointed and much less pubescent beneath; its fruits are also thicker.

Psychotria epiphytica Elm. n. sp.

Epiphytic upon the limbs of large trees; branches rigid, smooth, brown, breaking with a snap, 1 cm. thick, terete, glabrous even the pale young portion, the numerous branchlets usually in subwhorls. Leaves also copious, opposite, closely scattered along all the branchlets, ascending or horizontal, shining, glabrous, pale green on both sides and similarly curing very dark or reddish brown, deeply folded and the acuminate apex strongly recurved, coriaceous, while drying becoming detached, base broadly obtuse, entire, leaving rim-like scars after falling, normal blades 3 cm. long by 1.25 cm. wide across the middle or a trifle below it, ovately oblong or the smaller ones broadly lanceolate; midvein black and quite evident; the lateral nerves 3 to 5, ascendingly curved, more evident from the upper side, reticulations none; petiole nearly black, 3 mm. in length; interaxillary stipule chartaceous, glabrous, caducous, broad and rounded at apex, 4 mm. long. Infrutescence terminal, erect, 4 to 6 cm. long, branched from below the middle; peduncle one third the length, striate, subtended at the base by stipular bracts and a pair of leaves; branches erect or ascending, angular, freely rebranched from above the middle, all branchlets subtended at their articulate bases by rim-like bracts or bract vestiges; fruits upon very short stipes which are likewise subtended by bracteoles; mature drupes in the fresh state subglobose, ellipsoid when dry, 7.5 mm. long when fresh, less than 5 mm. long in the dry state, 7 mm. thick across the middle, light chalky white, longitudinally grooved on the two sides, reddish brown, terminated by the persistent 4-lobed calyx, glabrous and smooth even in the young state; pyrenes 2, elliptic from the side view, equally tapering and rounded at both ends, 3.5 mm. long, nearly 2 mm. wide across the middle, occasionally the inner side of one pyrene is concave and the opposite pyrene has a convex inner surface, back with edges rounded.

Type specimen number 14199, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Upon steep forested slopes near the ridge at 5500 feet altitude or just above lake Donao. "Bangog" in Manobo.

It is neither of my *P. cuernosensis* nor *P. elliptica.*

Psychotria erythrotricha Elm. n. sp.

Shrub 3 to 5 m. high; stem 1 dm. thick or less, branched from below the middle; the branches ascending and ultimately crookedly rebranched; wood moderately soft, whitish, covered with a smooth brown bark; twigs ascendingly curved, reddish hairy especially toward the young tips. Leaves coriaceous, ascending or horizontal, flat except the recurved acute to acuminate apex, deeper green above, base cuneate, entire, red hirsute on both sides especially beneath, oblong or obovately oblong, chiefly with only 2 to 3 pairs toward the ends of the branchlets, the larger blades nearly 15 cm. long and 4.5 cm. wide a trifle above the middle, frequently smaller especially the uppermost ones; midrib densely latericius hairy and prominent beneath, less so above; lateral nerves 9 to 11 or even 13 pairs, oblique, subparallel, slightly curved, tips not united or very obscurely so, reticulations none; petiole varying from 5 to 15 mm. long, similarly hairy, only fluted along the upper side; stipule caducous, hairy on the outside, brown, rather short or longer; bud bract 2 cm. long, broad, irregularly laciniate across the broad apex, hairy on the outside and on the inner side toward the base. Infrutescence terminal, erect; peduncles 1 or more, subterete, 3 to 5 cm. long, usually short branched toward the top, occasionally from below the middle or toward the base, soft melleus pubescent, subtended by a series of linear lanceolate 1.5 cm. long pubescent bracts; branchlets few, divaricate, more or less angular, the upper ones subtended by very linear much reduced bracts. Fruits in small terminal clusters, sessile, subtended by dense brushes of deeper colored hairs and brown membranous bracteoles; drupes ellipsoid, green or turning reddish brown especially on the exposed sides, nearly 1.5 cm. long, 7.5 mm. across the middle, bristly pubescent, rugose in the dry state, similarly tapering toward both ends, at the apex abruptly contracted into a 2 to 3 mm. long hairy calyx tube which terminates by 5 blunt calyx teeth; pyrenes 2, plane on the inner side, the dorsal side roundly 4-rugose besides the edges, very much compressed at the narrowed base, 9 mm. long by 6 mm. wide across the middle or above it, truncate at apex.

Type specimen number 13486, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Found in damp earth of the jungled woods near the summit of Duros peak at 3750 feet altitude. "Pasnohan" is the Manobo name.

Very similar to *P. pilosella Elm.* except the different calyx upon the sessile fruits which are subtended by bracts.

Psychotria loheri Elm.

Field-note:—Tree-like shrub; stem several inches thick, 15 feet high, crooked, terete, branched from below the middle; wood rather soft, sappy white, quite without odor or taste; bark smooth, grayish; main branches few, ascending, numerously rebranched at top; twigs lax, greenish gray; leaves coriaceous, horizontal, flat, dull green above, very much lighter beneath; infrutescence ascending, the green stalks bearing melleus colored fruits which are pyriform or obovoid.

Represented by number 14162, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Gathered on wet humus covered stony soil of the deeply forested lagoon region at 5000 feet altitude. "Alibatbat" is the native or Manobo name.

Psychotria luzoniensis Vil.

Field-note:—Laxly branched shrub; stem few inches thick, 10 to 15 feet high, subterete, branched from the middle; wood whitish, rather soft, odorless and tasteless; bark smooth, dull brown; twigs lax, curved, tips usually ascending; inflorescent stalks pale green, calyx brownish, corolla white; fruits short ellipsoid or obovoid, aurantiacus; leaves subcoriaceous, ascending but strongly recurved toward the apex, paler green beneath.

Represented by numbers 13740 and 14230, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in densely wooded depressions at 3500 feet altitude between Duros and Cawilanan peaks. "Madantawan" is the vernacular Manobo name.

Psychotria urdanetensis Elm. n. sp.

Low and lax undershrub; stem terete, 2.5 cm. thick, erect but branched from near the base, flatly topped, 1 to 2 m. high; wood rather soft but whitish, tough, with a brown pith, covered with smooth brown bark; branches quite rigid, spreading, rebranched, the suberect relatively short twigs latericius pubescent. Leaves opposite, fairly numerous, horizontal, submembranous, flat, gradual toward the recurved acuminate apex, base obtuse or obtusely rounded, much paler green beneath, drying grayish green, entire, glabrous, variable in size, the larger blades 6 cm. long by 1.5 cm. wide across the middle or a trifle above it, the larger leaves narrowly oblong or oblanceolate, smaller ones lanceolate; midrib conspicuous and reddish hairy beneath; lateral nerves 5 to 8, likewise prominent and similarly hairy beneath, ascendingly curved, the tips of the upper ones united, reticulations none; petiole 5 to 8 mm. long, densely latericius hairy especially on the younger ones; bud bract elongated and slenderly acuminate or oblongish, reddish brown in the dry state and crisply hairy, caducous, 1.5 cm. long, fully one third as wide toward the base, thin; dry stipules short, interaxillary, abruptly pointed or truncate. Flowers usually in few sessile clusters at the ends of the branchlets, erect, subtended by bud-like bracts; calyx 3 mm. long, greenish except the dark purple rim, relatively thick, bristly hairy, truncately terminated by 5 apiculations, the upper portion dark purple; corolla whitish, erect, 5 mm. long; ovary pale yellow, glabrous, the apical portion thickened and disk-like. Drupes dark ruber red, when mature turning nearly black, sessile or subsessile or distinctly stipitate, obovoid, sparsely strigose or becoming glabrous, less than 1 cm. long, 6 mm. wide above the middle, not ridged in the dry state; the 2 pyrenes 7.5 mm. long, 5 mm. wide across the rounded upper part, ventral side plane and with a median crease, obovoid from the side view, smooth on the deeply convex outer side.

Type specimen number 13703, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Collected in moist more or less stony ground in the dense humid forests about lake Donao at 5000 feet altitude or above it. Common in the cold moss laden forest only! "Macagong" in Manobo.

Psychotria velutina Elm. n. sp.

A strict or suberect shrub; stem 1.5 cm. thick, 1 to 2 m. high, only sparingly branched; twigs suberect, heavy, green, terete. Leaves horizontal or descending, thickly coriaceous or subchartaceous, flat, only the abruptly acute tips recurved, toward the base broadly cuneate or rounded, opposite, generally with only 1 or 2 pairs on each twig, obovate or obovately oblong, much paler green beneath, curing greenish gray, the entire margins slightly curved upon the nether more or less soft velutinous side, glabrous and rugose above, the average lamina 2 dm.long by 1 dm. wide across the widest portion; midrib bold beneath, green but drying yellowish, velutinous beneath, glabrous and slightly ridged along the upper side; lateral pairs pinnate, 12 to 15 on each side, ascending, tips plainly united, similar to the midrib, cross bars fine and equally evident from both sides; petiole 3 to 5 cm. long, compressed or subterete, occasionally the blade minutely decurrent along its sides, velutinous when young, glabrate when old; stipule interaxillary, 1 cm. long, brown and velutinous on the exterior, apex blunt, caducous, rather broad and forming a sort of a sheath. Inflorescence terminal, 3 cm. long, twice as long in the fruiting state; central peduncle 5 cm. long when in fruit, the two or few lateral short branched ones much thinner and only one half as long, all subtended at the base by deciduous stipular bracts, bearing subcapitate clusters of flowers or fruits at the distal ends, similarly velutinous in both stages; calyx glabrous, short turbinate, 2.5 mm. long, nearly as broad across the truncate obscurely apiculate apex; corolla segments whitish, 5, united toward the base, 5 mm. long, the lobes oblong and reflexed, glabrous except the dingy white hairs in the throat; stamens 5, alternating with the segments and inserted upon the throat; filaments filiform, 2 mm. long, glabrous; anthers one half as long, oblong, with truncate ends, dehiscing along the inner side, connective rather thick and very dark brown; apex of ovary subglabrous and crustaceous, the bifid stigma finely ciliate; fruiting pedicels 3 to 5 mm. long, glabrate; drupes less than 1 cm. long, subglobose but truncately obovoid when dry, rather hard, shining, finally exactly aurantiacus, ridged, without bract vestiges; pyrenes 2, shallowly concave on the ventral side, tapering at the base, broadly rounded at apex, with sharp edges, sharply 4-sulcate on the back, 8 mm. long, 2 mm. less in width above the middle.

Type specimen number 13605, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

This low sparingly branched and large leaved undershrub inhabits moist fertile soil of dense forests in the depression between Duros and Cawilanan peaks at 3500 feet altitude. The Manobo name is "Magadagad."

Allied to *P. plumeriaefolia Elm.*

RANDIA Linn.

Randia pubifolia Elm. n. sp.

An erect shrub; stem 5 to 8 cm. thick, 3 to 5 m. high, branched from below the middle; wood moderately soft, tasteless and with a greenish odor, dingy white; bark smooth and isabellinus or grayish and checked; branches divaricate, slender, sparingly rebranched, yellowish gray, velvety tomentose for the twigs. Leaves horizontal or descending, flat, opposite and well scattered, submembranous, entire, obovately oblong or merely oblong, the smaller ones subelliptic, apex with a short though sharp point, base broadly obtuse or rounded, curing equally brown on both sides, short velvety pubescent especially on the nether side, the average lamina 15 cm. long and 7 cm. wide across the middle, smaller ones only shorter; midvein prominent beneath toward the base, similarly tomentose; lateral nerves 6 to 8 pairs, ascending, tips very faint and scarcely united, with soft hairs, more numerous at the intersection of the faint cross bars; petiole 1 cm. long or less, densely velvety short pubescent; petiole up to 8 mm. long, the basal one third broad, the upper part setaceous, also velutinous. Fruits axillary or more frequently along the branchlets, few to several clustered, dark green, then fulvus, finally purpureus, obovoidly globose, the larger ones nearly 1 cm. across, with the persistent calyx rim still pubescent or puberulent, usually costulate, 2-celled by a thin portion; pedicels slender, 1 cm. long or less, velutinous hairy, arising from a very short common stalk or tubercle; seeds about 3 or more in each cell, irregular, 4 mm. long or wide.

Type specimen number 14060, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Collected in stony ground of humid forests at 3500 feet altitude in the saddle between Duros and Cawilanan peaks.

Approaches *R. ticaensis Merr.* and *R. mindoroensis* of the same author. It may be the fruiting specimen of *Tricalysia negrosensis Elm.*, but our leaves are more pubescent and relatively wider; fruiting cells contain more than two seeds, the ovules of which are not pendulous.

Randia whitfordii (Elm.) Merr.

Field-note:—A rather small erect tree; stem 8 inches thick, 25 feet high, branched from the middle, subterete; wood dingy or yellowish white, odorless and without taste, heavy, rather hard; bark smooth, yellowish, relatively thin; branchlets lax and horizontally spreading, yellowish; leaves smooth, conduplicate, recurved at apex, much paler green beneath, coriaceous; fruits hard, green, solitary from the axils, 2-celled, severally seeded in each.

Represented by number 13299, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

Gathered in red sticky soil of a wooded ravine at 1750 feet altitude. "Simatonog" is its Monobo name.

SARCOCEPHALUS Afzel.

Sarcocephalus multicephalus Elm. n. sp.

Small slender tree; stem 2 dm. thick, terete, 8 m. high or higher, branched from the middle; wood soft, dingy or yellowish white, slightly bitter, odorless; bark grayish brown, minutely checked longitudinally, yellowish otherwise; main branches divaricate, numerously rebranched toward the ends; twigs lax, horizontal or drooping, the green ultimate portion glabrous. Leaves opposite, well scattered along the branchlets, quite numerous, submembranous, horizontally spreading or pendant, glabrous, strongly curved upon the upper darker green surface, curing unequally brown on both sides, entire, the acuminate to subcaudate apex recurved, base acute to obtuse or occasionally rounded, oblong or ovately oblongish, the lamina 4 by 12 cm. in size; midrib prominent beneath and dull reddish brown, flat along the upper side; lateral nerves oblique, 7 to 9 pairs, similar in color but less prominent beneath, parallel and nearly straight, their ends anastomosing, reticulations very fine and obscure on the nether side; petiole 1 to 1.5 cm. long, glabrous, quite slender, nearly plane or only shallowly grooved along the upper side; stipule caducous, interaxillary, 5 mm. long, triangularly oblong, dull brown when dry, likewise glabrous. Heads solitary in leaf axils, numerous, occasionally terminal, concrete, globose, 1.25 cm. in diameter or smaller, the basal portion circularly concave, coarsely pitted, greenish except the grayish brown depressions, drying grayish white; peduncle 1 to 1.5 cm long, strict, mostly descending, green, glabrous, articulated above the middle; ovaries 2-celled and severally ovuled, combined into a concrete fleshy mass; seeds pendant from aurantiacus cushion-like placenta, oblong from the side view and somewhat compressed, brown, minutely reticulate, 2 mm. long, one half as wide, the meat surrounding them light orange yellow.

Type specimen number 13877, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Inhabiting black compact ground of secondary forests or woods bordering grassy glens or in among the hemp fields along the Minusuang river at about 250 feet altitude. The Manobos call it "Cabac."

Distinct from yet nearest to *S. subditus Miq*. (collected by me in the mount Apo region and wrongly distributed under *S. horsfieldii Miq.*; see flowering and fruiting numbers 10886 and 11611).

TARENNA Gaertn.

Tarenna cumingiana (Vid.) Elm. n. comb. *Webera cumingiana Vid.* Phan. Cum. Philip. 119, 1885.

Field-note:—Small erect tree; stem terete, 6 inches thick, 20 feet high, its main branches arising from the middle; wood soft, white, odorless and without taste; bark blackish brown, smooth, that on the branchlets reddish brown; main branches divaricate, long, freely rebranched, the angular twigs ascendingly curved; leaves horizontal, the suberect young ones much paler green, submembranous, much deeper green above, flat, only tips recurved; infrutescence also green, erect, the fruits 2-celled, each with numerous small angular seeds.

Represented by number 13363, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July, 1912.

In sticky clay on a damp densely forested ridge at 2000 feet altitude of Giwantanan.

Tarenna meyeri Elm. n. comb. *Pavetta meyeri Elm.* Leaf. Philip. Bot. III, 1015, 1911.

Tarenna ebracteata Elm. n. comb. *Randia ebracteata Elm.* Leaf. Philip. Bot. IV, 1354, 1912.

TIMONIUS Rumph.

Timonius caudatifolius Elm. n. sp.

Lax epiphytic shrub; stems few, descending, 2 cm. thick, terete, 1 to 3 m. long, rebranched from near the base; branchlets very slender and lax, the ascending and relatively short twigs very flexible, the young portion pale fulvus hirsute. Leaves coriaceous, gracefully recurved, curing unequally brown on the upper and lower sides, opposite, more or less crowded toward the ends of the branchlets, the entire sides curved upon the nether side at least in the dry state, broadly lanceolate, varying from 1.5 cm. to 4.5 cm. wide below the middle or toward the base, base rounded, the upper two thirds gradually tapering to the very slender caudate apex the young ones very sparsely grayish white, strigose, both surfaces very finely marked with striae; midrib raised and cinereous, strigose beneath, deeply impressed along the upper side; lateral nerves faint, mostly 2 but occasionally 3, ascendingly curved, reticulations none; petiole averaging 3 mm. long, at first fulvus hirsute, caniculate, after falling leaving bristly scars or nodes; bud bract membranous, 7.5 cm. long, brown, at the base and on its outside provided with a brush of dark brown subpersistent hairs, caducous, very finely pubescent on the dorsal side only, setaceously pointed from the base. Flowers axillary, solitary; pedicel recurved, slender, 1 cm. long, grayish brown puberulent, bearing a single terminal flower; flowers subtended by a pair of sharply acuminate setosely hairy 2 mm. long teeth; calyx 3.5 mm. long, ovate but rather constricted above the middle or at the calyx tube, bearing the acuminate slightly unequal teeth, brown hairy on the outside; corolla yellowish brown pubescent, especially dense toward the apex, adnate in bud but separating into 4 segments; stamens erect, from near the base of the corolla, subsessile, oblong; style short, thick, ciliate hairy beneath the 4-lobed stigmas.

Type specimen number 14190, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

In the mossy wind swept forests of wet stony soil at 5250 feet altitude or just above the lake Donao. Called "Badyong" by the Manobos and it was lodged fifteen feet above ground.

Nearest to *T. epiphyticus Elm.*

Timonius urdanetensis Elm. n. sp.

A slender erect and shrub like tree; stem 4 cm. thick, 5 m. high, branched from above the middle; wood dull yellowish white, odorless and tasteless; bark smooth and grayish brown on the surface, thin, yellowish otherwise; main branches not long, ascending, neither numerously rebranched, the glabrous twigs ascending. Leaves toward the abrupt and rather bluntly acute apex, base broadly obtuse or obtusely rounded, much paler green beneath, very unequally brown in the dry state, the entire margins finely ciliate and slightly involute, glabrous except the nerves beneath, the upper surface striately checked, diverse in size, opposite, rather crowded toward the ends of the twigs, the larger blades 13 cm. long by 6 cm. wide above the middle but usually smaller; midrib bold and strigose beneath, shallowly sunken along the upper side, atropurpureus toward the base; lateral nerves 6 to 10 on each side, divaricate, tips ascendingly curved and usually forked, similar in vestiture and color; the cross reticulations very faint even beneath; petiole from 1 to 3 cm. long, glabrous, flattened along the upper side, nearly black when dry, also atropurpureus tinged; bud bract 1.5 cm. long or less, 5 to 8 mm. wide, oblong, yellowish green and rounded, apex purplish, only the outside minutely and grayish puberulent. Young infrutescence axillary, similarly spreading; peduncle solitary, strict, strigosely puberulent, 3 cm. long, compressed, greenish, ternately short branched at the distal end; flowers few to several, the terminal one sessile, the others scattered along the sides of the very short and unequal distichous branchlets; young fruits subterete, green, ovoidly elongated, bearing the truncate calyx rim, when mature dull red, subglobose, 7.5 mm. across, glabrous, slightly rugose especially in the dry state; stone-like pyrenes about 12, arranged parallel, the outer ones somewhat smaller, normal ones nearly 5 mm. long, 1.5 mm. thick, somewhat compressed and obscurely curved along the ventral side, straw brown, equally tapering at both ends.

Type specimen number 14197, *A. D. E. Elmer,* Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

Discovered in moist moss covered soil of cold windy forests at 5500 feet altitude along the general route from lake Donao to the summit of the mountain after which it is named. Its native Manobo name is "Mayponog."

Appearing like *T. obovatus Elm.* and from memory it was so determined.

UROPHYLLUM Wall.

Urophyllum urdanetense Elm.

Erect or suberect shrub; stem 5 to 8 cm. thick, terete, 3 to 4 m. high, branched from below the middle; wood sappy white, rather soft, slightly bitter, odorless; bark dull brown and gray, smooth or thinly checked at the base, greenish otherwise; branches horizontally spreading, freely rebranched, the ultimate ones drooping, glabrous, terete except the flattened apical portion, curing greenish. Leaves rigidly coriaceous, descending, also glabrous, paler green beneath even so in the dry state, entire, opposite, the slenderly acuminate to caudate apex recurved, variable in size, broadly obtuse or rounded at base, oblongish or ovately oblong, the larger blades 3 cm. wide across the middle or a little below it and three times as long; midrib yellowish brown and prominent beneath, narrowly caniculate above; lateral nerves 6 pairs or less, ascendingly curved, similar in color and prominence beneath, cross bars rather evident beneath; petiole 1 cm. long or shorter, when young puberulent along the upper obscurely caniculate side; stipule short and rim-like; bud bract setaceously acuminate, 6 mm. long, faintly grayish puberulent on the outside. Inflorescence or infrutescence 2 to 3 cm. long, from the leaf axils, similarly spreading; peduncle about two thirds that length, subterete, in the flowering state puberulent, usually solitary, at the distal end and generally one third below it provided with whorls of 3 or more sharply acute bracts; flowers terminal, 1 to 2 or 3-clustered; pedicel slender, spreading, the fruiting ones 8 mm. long, slightly puberulent in the flowering state; calyx 3 mm. high, 1 to 2 mm. broader across the obscurely undulate rim, glabrous, green; corolla in the bud state ridged and well pointed, 3 mm. long, united below the middle, caducous as a whole, glabrous except the hairy throat; segments valvate, ultimately reflexed, sharply acute, usually 5 but occasionally one or two more of a smaller size, yellowish white; stamens normally 5, alternating with the segments and inserted upon the throat; filaments inwardly curved, short, glabrous; anther basifixed, 0.5 mm. long, emarginately truncate at base, apex more pointed; young fruits green, when mature orange red, the largest ones in the fresh state nearly 1 cm. across, when dry much smaller, compressed, globose, bearing the persistent calyx rim; seeds very numerous, imbedded in a pulpy mass, light brown, subglobose or short ellipsoid, beautifully pitted.

Type specimen numbers 13788 and 14155, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September and October respectively, 1912.

The first number was collected on one of the summit peaks of Urdaneta at 6000 feet altitude, the other number on Cawilanan peak at a 1000 feet lower elevation. Both were growing in loose more or less stony ground of wind swept cold and wet moss laden woods. "Busayon" in Manobo.

Leaves less than one half as large as in *U. memecyloides Rolfe* based upon *Cuming's* number 1678 collected on Samar. Neither can it be referred to *U. glabra Jack* nor to *U. arboreum (Reinw.) Korth.*

UNCARIA Schreb.

Uncaria laevifolia Elm. n. sp.

Large looping climber; old stem 3.5 cm. thick, terete; wood dingy white, bitter, very soft, nearly odorless, with a large brownish pith; bark gray, smooth, the hypodermis green; main branches long, green, angular, freely rebranched; twigs drooping, occasionally provided with green axillary much recurved and flat hooks, quadrangular except the flattened nodes, even the young tips glabrous. Leaves recurved, subcoriaceous, shining and deeper green on the upper side, ovately rotund or elliptic, entire, apex with a very abrupt acute point, base quite broadly rounded, opposite, not numerous, 2 dm. long by 13 cm. across the middle or below it, curing similarly brown and sublucid even on the herbarium specimens, glabrous; midrib yellowish, conspicuous, less prominent on the upper side, darker brown in the dry state; lateral nerves also yellowish, 7 or 8 pairs, ascendingly curved, also prominent beneath and usually with tufts of axillary hairs in their axils, distinctly grooved along the upper side, tips anastomosing; cross bars slender and numerous, relatively plain beneath, minute tufts of hairs in their axils on the upper side (giving the nerve a stitched appearance); petiole similar in color, 1 cm. long, almost one half as wide at the base, excavated along the upper side, glabrous; stipule not seen. Infrutescence pendant, axillary; peduncle solitary, 3 to 5 cm. long, articulated and provided with a caducous bract a trifle above the middle; that portion below the articulation glabrous, curved, flattened, gradually tapering from the base, quadranagular and tawny pubescent; receptacle 4 mm. in diameter, fulvus hairy; flowers or fruits divaricately spreading, very numerous in a head, slenderly stipitate; calyx neck constricted, doubly fusiform, bearing at the apex 5 rather broadly rounded persistent segments, appressed yellowish brown pubescent; ovary 1 cm. long, similar in shape, subterete or compressed, creased along the two sides, 2-celled; stipes 1 to 2 cm. long, very slender, cinereously strigose; nearly mature capsule 1.5 cm. long and 3 mm. thick.

Type specimen number 14178, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October, 1912.

This tall forest tree climbing liana was collected on the ground after a heavy storm in a humid gluch between Duros and Cawilanan peaks at 3500 feet altitude. "Cawilan" in Manobo.

Distantly related to *U. canescens Korth.*

Uncaria philippinensis Elm.

Field-note:—A scandent and widely sprawling shrub; stem terete, 1.5 inches thick, bendable; wood soft, brownish white, with a large pith; old bark smooth and yellowish gray; branches freely rebranched, green, angular or square; twigs drooping, subtended by yellowish bracts; leaves descending, submembranous, lucid above, subtended by similar bracts and with a yellowish green recurved spine from the leaf axils; heads divaricate, more descending than the leaves; stalks, bracts and calyx greenish, the exposed calyx segments and corolla nearly melleus; flower soft in texture.

Represented by number 13507, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Sprawling over jungled woods along a fertile stream bank at 250 feet altitude on the trail to Bayabas. "Sabilan" is the Manobo name.

WILLIAMSIA Merr.

Williamsia mindanaense Elm. n. sp.

Erect shrub; stem 5 cm. thick, terete, 5 m. high, rather crooked; wood quite soft, sappy white, odorless and tasteless; branches arising from below the middle, divaricate and laxly rebranched; twigs horizontal, slender, dark green, the glabrous ends obscurely compressed, minutely tubercular, drying greenish. Leaves similarly spreading, rigidly chartaceous, flat, gradually recurved toward the sharply acuminate to subcaudate apex, base obtusely rounded, opposite and well scattered, oblong, grayish green in the dry state, lucid above, much paler green beneath, entire, the average blades 1 dm. long by 3.5 cm. wide in the middle region, glabrous; midrib conspicuous beneath, minutely channeled along the upper side; lateral nerves also conspicuous beneath, about 7 pairs, much ascending and especially curved toward their ends which are scarcely united except the upper ones, cross bars and reticulations relatively obscure yet quite evident from both sides; petiole glabrous and drying dull green, subterete, grayish puberulent along the upper obscurely grooved side, leaving large nodes after falling, 1 cm. long; bud bracts 1.25 cm. long, 2 mm. wide, sparsely hairy on the outside, greenish, straight, acute or acuminate, deciduous, after falling leaving a brush of fine grayish white hairs exposed. Flowers few clustered in the leaf axils or in their scars, erect or suberect, quite rigid; the thick slightly hairy usually 3 sharply pointed and more or less united subtending bracts dark green and persistent; calyx campanulate, subsessile or very shortly yet distinctly pedicelled, 5 mm. high, 1 to 2 mm. wider across the obscurely 5-toothed apex, puberulent or finely pubescent, the broad lobes reticulately veiny; corolla greenish white, 1 cm. long, glabrous except the dorsal side of the segments which is puberulent; lobes 7, reflexed, rather thick, linearly lanceolate; stamens also 7, alternating with the segments and inserted upon the throat which bears a dense brush of erect ciliate hairs, free portion of filament short, otherwise adnate to corolla tube clear to the base, glabrous; anthers linear oblong, 3 mm. long, emarginate at the base, apiculate at apex subbasifixed; ovary glabrous, one half superior, rugosely lobed; style short, strict, the clavate stigmatic portion lobed; mature drupe ovoid, flavus, at least 1 cm. long, yellowish gray hairy, bearing the rather large calyx rim; ovary about 7-celled or very much as in *Urophyllum;* seeds very numerous, brown, lenticular or short ellipsoid, 0.5 mm. across, pitted.

Type specimen number 13561, *A. D. E. Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August, 1912.

Inhabiting moist stony ground of a steep forested incline upon Duros peak at 3000 feet altitude. It was however more abundant at 1000 feet higher elevation on Cawilanan peak. "Siganog" in Manobo.

Critically distinguished from typical *W. sablanense* (*Elm.*) *Merr.* by its smaller, fewer nerved leaves whose petioles are likewise relatively shorter. Our fruits are appressed pubescent and there are minor differences in the flowers.

XANTHOPHYTUM Reinw.

Xanthophytum fruticulosum Reinw.

Field-note:—A low suberect and unbranched subfrutescent plant; stem dull green or brownish, crooked, 1 to 2 feet high; roots rigid and crookedly rebranched; leaves opposite, descending, thinly coriaceous, flat, dull green above, much lighter green beneath, midrib yellowish; infrutescence in dense clusters, green, from similarly colored descending short axillary stalks; calyx green, corolla white, fruits yellowish.

Represented by number 13720, *Elmer*, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September, 1912.

Gathered in moist humus covered soil of densely forested steep slopes in the depression between Duros and Cawilanan peaks at 3500 feet altitude. It is called "Lood-lood" by the Manobos.

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Solanum *biflorum* 1839
  sparsiflorum 1838
Spathoglottis *chrysantha* 1572, 1573
  elmeri 1572
  elmeri 1573
Strobilanthus palawanensis 1686
Sumbaviopsis *albicans* 1544
Swintonia foxworthyi 1751
  schwenkii 1752
Symplocos *polyandra* 1842
  pulgarensis 1841
Taeniophyllum arachnites 1588
  elmeri 1588
Tainia elmeri 1570
Talauma *gitingense* 1810
  pulgarense 1809
  villariana 1537
Tarenna cumingiana 1898
  ebracteata 1898
  meyeri 1898
Taxatrophis *ilicifolia* 1814
  mindanaensis 1815
  obtusa 1813
Terminalia copelandi 1759
  iwahigensis 1760
Tetracera *macrophylla* 1772
  subrotundata 1771
Thea megacarpa 1842
Timonius caudatifolius 1898
  epiphyticus 1899
  obovatus 1900
  urdanetensis 1899
Thunbergia fragrans 1685
Tricalysia *negrosensis* 1896
Trichospermum trivalvis 1641
  cuneata 1643

- discolor 1641
- involucrata 1641
- *involucrata* 1644
- mindanaensis 1641
- *mindanaensis* 1643
- *negrosensis* 1641

Trigonachras brachycarpa 1614

Tristiropsis ovata 1605

Tropidia mindanaensis 1553

Uncaria *canescens* 1903
- laevifolia 1902
- philippinensis 1903

Unona agusanensis 1743
- *dehiscens* 1750
- *ebracteolata* 1745
- leytensis 1744
- miniata 1740
- palawanensis 1742
- *rubra* 1741

Urophyllum *arboreum* 1902
- *glabra* 1902
- *memecyloides* 1902
- urdanetensis 1900

Uvaria cardinales 1748
- *concava* 1745
- *littoralis* 1749
- *ovalifolia* 1749
- nudistellata 1746
- *scandens* 1746
- sibuyanensis 1747
- *stellata* 1747
- subverrucosa 1745

Vatica *obtusifolia* 1541

Ventilago palawanensis 1829

Vermicularia pandani 1546

Webera *cumingiana* 1898

Wickstroemia pulgarensis 1844

Williamsia mindanaense 1904
- *sablanense* 1905

Wormia sibuyanensis 1772

Xanthophyllum *affine macrocarpum* 1677
- floriferum 1674
- *glandulosum* 1676
- *macranthum* 1674
- multiramosum 1676
- *multiramosum* 1677
- palawanensis 1673
- subglobosum 1676
- subglobosum longifolium 1677
- *subglobosum* 1678
- *vitellinum* 1674

Xanthophytum fruticulosum 1905

Xylopia densifolia 1749

Zanthoxylum *crenulatum* 1834
- iwahigense 1833

Zizyphus *cumingiana* 1829
- palawanensis 1828